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ENTRIES 1086-2426

AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

1086. ALWAY, F. J. **A phosphate-hungry peat soil.** Jour. Amer. Peat Soc. 13: 108-143. 1920.—Some Minnesota bogs are found to have a sufficient supply of lime and available nitrogen for the production of all crops suitable to the region. Phosphates, however, are very scant.—*G. B. Rigg.*

1087. ANONYMOUS. **Elephant-grass in elevated localities.** Agric. Gaz. New South Wales 31: 84. 1920.—Treats of *Pennisetum purpureum.*—*L. R. Waldron.*

1088. ANONYMOUS. **The department and elephant-grass.** Agric. Gaz. New South Wales 31: 143. 1920.—Treats of *Pennisetum purpureum.*—*L. R. Waldron.*

1089. ANONYMOUS. **Coffee in New South Wales.** Agric. Gaz. New South Wales 31: 133. 1920.—This crop (*Coffea* spp.) would be unsuited to New South Wales.—*L. R. Waldron.*

1090. ANONYMOUS. **Liming, cultivation and manurial experiments at Margam, Australia.** Australian Sugar Jour. 11: 679-681. 1920.

1091. ANONYMOUS. **Further reports on elephant grass.** Agric. Gaz. New South Wales 31: 244. 1920.

1092. ANONYMOUS. **Rice culture in New South Wales.** Agric. Gaz. New South Wales 31: 232. 1920.—Results so far not encouraging but further trials are advised.—*L. R. Waldron.*

1093. ANONYMOUS. **Weed seeds.** Sci. Amer. Monthly 1: 316. 1920.—Popular.—*Chas. H. Otis.*

1094. ANONYMOUS. **Paper from bagasse.** Sci. Amer. Monthly 1: 283. 1920. [Review of a paper in The Technical Engineering News. Feb., 1920.]—Describes the process for commercially making a special paper from bagasse, which is sugar cane from which the juice has been extracted.—*Chas. H. Otis.*

1095. ANONYMOUS. **Home-made syrup from sugar beets.** Sci. Amer. Monthly 1: 285-286. 1920.—This appears to be a brief of a paper by ORT and WITHROW in the Journal of Industrial and Engineering Chemistry. Feb., 1920.—*Chas. H. Otis.*

1096. ANONYMOUS. **El zacaton como material prima para papel. [Zacaton as a paper-making material.]** Revista Agric. [Mexico] 4: 107–111. *1 fig.* 1919.—A popular account based on: U. S. Dept. Agric. Bull. 309. 1919.—*John A. Stevenson.*

1097. ANONYMOUS. **Origen, cultivo e industria del cacahuate. [Origin, cultivation and commercial aspects of the peanut.]** Jalisco Rural [Mexico] 2: 81–86. 1920.—Copied from El Boletin de la Camara Agric. de Leon [Mexico].—*John A. Stevenson.*

1098. ATKINSON, ESMOND. **Weeds and their identification.** New Zealand Jour. Agric. 19: 232–234. *1 fig.* 1919.—This is a continuation of a series of articles interrupted by the war in 1916. Plants known as "winter annuals" are under discussion. Spurrey (*Spergula arvensis*) is described in detail at various stages of growth. It is reported as a useful plant in some countries, but it can be considered only as a noxious weed in New Zealand. Its position as a weed, and possible control measures are discussed.—*N. J. Giddings.*

1099. AUFMÜLLER, F. **Nutation und Feinheitsgrad der Spelzen bei zweizeiliger Gerste. [Nutation and the degree of fineness of the glumes in two-rowed barley.]** Illustrierte Landw. Zeitg. 39: 430–431. *Fig. 332–333.* 1919.—The heads of varieties having fine glumes are shown by measurements to stand more nearly upright than those having coarser glumes. The former varieties are of higher quality but the latter are more productive.—*John W. Roberts.*

1100. BANCROFT, WILDER T. [Rev. of: PETERS, CHARLES A. **The preparation of substances important in agriculture.** *3rd. ed.* 19 *x* 14 *cm., vii* + *81 p.* John Wiley and Sons, Inc.: New York, 1919. $0.80.] Jour. Phys. Chem. 23: 444. 1919.

1101. BANÓ, JOSE DE. **Dos cosechas de avena por una. [Two crops of oats for one.]** Rev. Agric. [Mexico] 4: 154–156. *2 fig.* 1919.—A ratoon crop secured under favorable weather conditions at small labor cost.—*John A. Stevenson.*

1102. BARBER, C. A. **The growth of sugar cane.** Internat. Sugar Jour. 22: 198–203. 1920. —The fifth article of a series on the growth of sugar cane deals with the rate of maturing of the cane plant as a whole, the rate of early development, the average length and thickness of the mature joints, and the richness of the juice in branches of different ages. [See next following Entry, 1103.]—*E. Koch.*

1103. BARBER, C. A. **The growth of sugar cane.** Internat. Sugar Jour. 22: 76–80. 1920. —The fourth article of a series on the growth of sugar cane deals with the formula for the branching of the cane plant. [See next preceding Entry, 1102.]—*E. Koch.*

1104. BARBER, C. A. **Progress of the sugarcane industry in India during the years 1916 and 1917.** Agric. Res. Inst. Pusa Bull. 83. *46 p.* 1919.—The cane varieties in general use are poor, and the cultural practices and methods of handling the product primitive. The Department is endeavoring to introduce improvements along these lines, and the reports cover some of this work as carried out in the various provinces. Reports are given for Madras, Travancore, Mysore, Bombay, Central Provinces, Bengal, Bihar and Orissa, United Provinces, Punjab, North-west Frontier Province, Assam, and Burma.—*N. J. Giddings.*

1105. BESSON, M. A., AND ADRIAN DOANE. **Darso.** Oklahoma Agric. Exp. Sta. Bull. 127. *20 p. Fig. 1–6.* 1919.—Darso is a new grain sorghum of unknown origin, possessing superior drouth resisting qualities. It is a dwarf variety of very uniform size, early maturing, leafy, red-seeded. The forage has a higher total sugar content than kafir or feterita. The feeding value of the seed is less than that of black-hulled white kafir. It is recommended as a grain sorghum in the drier regions of Oklahoma, Texas, and Kansas, but not in the more humid regions where other grain sorghums and corn make satisfactory yields.—*John A. Elliott.*

1106. BEVERLEY, J. **Maize notes.** New Zealand Jour. Agric. 19: 242–243. 1919.

1107. BOLLEY, H. L. **Official field crop inspection.** Proc. Assoc. Official Seed Analysts 1919: 22-31. 1919.—Author believes "that the first step in cereal crop improvement rests in further extension of our state seed and weed laws and in the activity of the forces represented by them, to include proper control of seed crop production and of seed and grain distribution." Seed inspection laws alone have failed to insure seed and crop improvement since they inspect in the bin or bag after the goods has left the farm. Proposes for "every cereal producing state a law authorizing seed, field crop inspection, seed certification, seed standardization and seed sales lists" under the supervision of a competent officer, also providing for educational emphasis together with means for demonstrations and field work with seed plots.—*M. T. Munn.*

1108. BREAKWELL, E. **Popular description of grasses.** Agric. Gaz. New South Wales 31: 24-28. *Fig. 1-3.* 1920.—Habits of growth and seed production, palatability, behavior under irrigation and commercial possibilities are given for the genus Danthonia as found in New South Wales. *Danthonia longifolia, D. bipartita* and *D. pallida,* are figured. The Danthonias constitute 90 per cent of the grass herbage on the tablelands and slopes in New South Wales, and are common in western districts. Seed habits are fairly good. The Danthonias will be valuable in pastures in the future.—*L. R. Waldron.*

1109. BREAKWELL, E. **A remarkable fodder plant. Shearman's clover.** (*Trifolium fragiferum* var.) Agric. Gaz. New South Wales 31: 245-250. *4 fig.* 1920.—This report is given by the agrostologist. This clover was propagated vegetatively from an individual plant found growing alone several years previously. A taxonomic study indicates it to be unique, but closely allied to strawberry clover, *T. fragiferum.* The author suggests that it may have resulted from a cross between *T. fragiferum* and *T. repens* or *T. medium* or even between the two latter. Although under observation for over 20 years it has not been observed to produce viable seed. Compared with *T. fragiferum,* it is said to spread three times as quickly and to produce six times the amount of feed. Its palatability and nutritive quality are stated to be of the highest order. It thrives on marshy and slightly saline soils. It is not killed by frost. Chemical analyses are given.—*L. R. Waldron.*

1110. BREAKWELL, E. **Trials of Wimmers rye-grass.** (Lolium subulatum.) Agric. Gaz. New South Wales 31: 107-110. *2 fig.* 1920.—Conclusions as given are unfavorable to the grass both as to cultural results and palatability.—*L. R. Waldron.*

1111. BREAKWELL, E. **Bokhara Clover on the southern table-lands.** Agric. Gaz. New South Wales 31: 67. 1920.—Treats of *Melilotus alba.*—*L. R. Waldron.*

1112. BREASOLA, M. **La devitalizzazione dei semi di Cuscuta.** [**The killing of Cuscuta seeds.**] Staz. Sper. Agr. Ital. 52: 193-207. 1919.—This is a continuation of work which was reported upon in 1913. The purpose of the investigation was without screening to find a method of killing the seeds of Cuscuta in a lot of leguminous seeds. It was found that due to the different sizes of the seeds of *C. arvensis* and *C. Trifolii* screening would not separate the former from seeds of *Trifolium.* The method devised was that of heating the lot; incidentally it was found that the seeds of *Medicago sativa, Trifolium pratense, Trifolium repens* and *Lotus corniculatus* did not lose their vitality when exposed to the temperatures of experiment, i.e., 65°C. for one and two hours, 70°C. for one hour and 75°C. for one hour. In fact it was found that the number of seeds of these leguminosae germinating was in some cases greater after the treatment. The striking advantage was also found that the seeds of Cuscuta most easily screened out of seeds of the legume was the one that seemed to resist heat a little better (*C. Trifolii*) while the other (*C. arvensis*) was most easily killed. When tried in soil, the germinability of the two was found to decrease from 43.6 per cent to 11.8 per cent in *C. Trifolii* and from 55.6 per cent to 0.2 per cent for *C. arvensis* when heated for one hour at 75°C.—*A. Bonazzi.*

1113. BROWN, EDGAR. **Voluntary labeling by seedsmen.** Proc. Assoc. Official Seed Analysts 1919: 41–42. 1919.—**Following a suggestion made by the Department of Agriculture, many large seed houses and firms pledged their support to the proposal that seedsmen label all farm seeds sold, giving on each lot of 10 pounds or more, purity, germination, and date when tested, and if imported, the country of origin. A series of purchases of seeds from seed dealers throughout the country showed that 78 per cent of the samples were not labeled, however, "a larger percentage of the seedsmen who specifically agreed to label their seeds were found to comply with the agreement than was the case with seedsmen who did not so express themselves."**—*M. T. Munn.*

1114. BROWN, W. H. **Philippine fiber plants.** Forestry Bur. Philippine Islands Bull. 19. *115 p., 28 pl.* 1919.—See Bot. Absts. 5, Entry 1304.

1115. BRUNOL, GIL MORICE. **Algunos pastos naturales de Mexico. [Natural pastures in Mexico.]** Rev. Agric. [Mexico] 4: 58–62. *1 fig.* 1919.—Outlines the different types of pasture grasses in Mexico.—*John A. Stevens.*

1116. BURGESS, J. L. **Relation of varying degrees of heat to the viability of seeds.** Proc. Assoc. Official Seed Analysts 1919: 48–51. 1919.—The author conducted experiments with corn, wheat, oats, rye, cowpeas, soy beans, and garden beans—seeds most liable to injury by insect pests, with a view of ascertaining the critical temperature above which the viability of each species is affected. The results of the experiments are given in tabular form.—*M. T. Munn.*

1117. CALL, L. E. **Director's report.** Kansas Agric. Exp. Sta. 1917–18. *65 p.* 1918.—See Bot. Absts. 5, Entries 1466, 2024.

1118. CHAMBLISS, CHARLES E. **Prairie rice culture in the United States.** U. S. Dept. Agric. Farmers Bull. 1092. *26 p., 15 fig.* 1920.

1119. CLAYTON, W. F. **The tea industry in South Africa. I.** South African Jour. Indust. 3: 112–120. *Pl. 1–2.* 1920.—Brief history of the tea industry in Natal, and of the cultural methods employed.—*E. M. Doidge.*

1120. COCKAYNE, L. **An economic investigation of the Montane tussock grassland of New Zealand.** New Zealand Jour. Agric. 19: 343–346. *2 fig.* 1919.—This is the fourth of a series of articles dealing with the Montane tussock grassland. The California thistle, *Cnicus arvensis*, is reported as becoming firmly established in some areas which were bare from overgrazing. It seems to be palatable to some animals, and may help to establish other useful plants, in which case it should not be considered a weed.—*N. J. Giddings.*

1121. COWGILL, H. B. **Cross pollination of sugar cane.** Jour. Dept. Agric. and Labor Porto Rico 3: 1–5. 1919.—See Bot. Absts. 5, Entry 1478.

1122. CREVOST, C., AND C. LEMARIE. **Plantes et produits filamenteux et textiles de l'Indochine. [Fiber- and textile-producing plants of Indo-China.]** Bull. Econ. Indochine 22: 813–837. *Pl. 2.* 1919.—A continuation of the general paper on this subject, covering the families Asclepiadaceae, Ulmaceae, Urticaceae, Scitamineae, Bromeliaceae, Amaryllidaceae, Liliaceae, and Pontederiaceae.—*E. D. Merrill.*

1123. CROCKER, WILLIAM. **Optimum temperatures for the after-ripening of seeds.** Proc. Assoc. Official Seed Analysts 1919: 46–48. 1919.—The author made a study of freshly harvested seeds of species of Crataegus, American linden, sugar maple, peach, and two species of Ambrosia. These seeds are typical of those having dormant embryos. The changes that go on and lead up to their normal germination are spoken of as after-ripening of the embryos. The embryos of these seeds must go through certain fundamental physiological changes before they sprout normally, since the embryos will not grow at all or only abnormally when

they are naked and given all ordinary conditions favorable to germination. The optimum temperature for the process of after-ripening lies in the region of 4 to 5°C., and a constant temperature in these limits is very much more favorable than alternations between it and higher or lower temperatures. At freezing temperatures, after-ripening of these embryos progresses very slowly if at all, while temperature periods above 10°C. are especially detrimental to the process. The facts disclosed by the investigation raise the question whether nurserymen who layer their seeds to produce after-ripening would not do better to put the seeds in cold storage houses at optimum temperatures of 4 to 5°C., which would lead to a much more rapid and complete after-ripening than is attained in layering under fluctuating temperatures. It is the belief of the author that such methods should give returns in a greater percentage of seeds producing plants and in the general high vigor of the plants resulting from completed after-ripened embryos.—*M. T. Munn.*

1124. CROSS, W. E. **The Kavangire cane.** Louisiana Planter and Sugar Manufacturer 63: 397-399. *1 fig.* 1919.—See Bot. Absts. 5, Entry 2113.

1125. DAY, JAMES W. **The relation of size, shape and number of replications of plats to probable error in field experimentation.** Jour. Amer. Soc. Agron. 12: 100-105. 1920.—Variation is reduced by increasing the size of the plat to one-twentieth of an acre or over. Most accurate results are obtained from plats that are long and narrow and extend in the direction of greatest variation of the soil. An increase in the number of replications of a plat of given size increases the accuracy of the results.—*F. M. Schertz.*

1126. DEEM, J. W. **Pasture top-dressing test in Waipukurau county.** New Zealand Jour. Agric. 19: 295-296. 1919.—Sheep were used in these experiments and the results for two seasons indicate that it is well worth while to top-dress.—*N. J. Giddings.*

1127. DESCOMBES, PAUL. **Le reboisement et le développement economique de la France. [Reforestation and the economic development of France.]** Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 103-217. *2 fig.* 1918.

1128. DESCOMBES, PAUL. **Installation d'expériences prolongées sur le ruissellement. [Protracted experiments upon stream-flow.]** Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 17-35. *1 fig.* 1918.

1129. DOBLAS, José HERRERA. **El trigo tremesino. [Three-months wheat.]** Bol. Assoc. Agric. [España] 12: 47-52. 1919.—Discusses a variety of wheat known as "Tremesino" (three-months) secured by selection from the common fall type planted in Spain. Yields were much less than with the fall variety and it is not recommended for planting except where planting at the usual time has been impossible. The variety yielded in four experiments an average of 10.75 hectoliters per hectarea.—*John A. Stevenson.*

1130. DOBLAS, José HERRERA. **Estudio sobre el cultivo de la almorta. [Studies in the cultivation of the grass pea (Lathyrus sativus).]** Bol. Assoc. Agric. [España] 11: 665-674. 1919.—Botanical classification, uses, varieties, cultivation and yields of *Lathyrus sativus* (grass pea).—*John A. Stevenson.*

1131. DUNCAN, J. **Noxious weeds.** New Zealand Jour. Agric. 19: 366-368. 1919.—It is urged that more attention be given to the destruction of noxious weeds. Weeds should be destroyed before seeding and the assistance of the public should be enlisted to destroy weeds as soon as they are observed. Methods of weed dissemination are discussed and means of prevention are indicated. It is suggested that in sowing to pasture the best of seed and plenty of it should be used in order to obtain a good close sod. This tends to choke out and prevent growth and spread of weeds. Farmers should not admit thrashing machines to their farms until the machines have been thoroughly cleaned.—*N. J. Giddings.*

1132. Duysen, F. **Ueber die Keimkraftdauer einiger landwirthschaftliche Wichtiger Samen.** [Concerning the vitality of certain agriculturally important seeds.] Illustrierte Landw. Zeitg. 38: 282-283. 1919.—As the result of germination experiments it was found that the seeds of wheat, rye, barley and oats possess greater vitality than is generally supposed. Seeds of wheat 8 years old were 80 per cent viable and those of 14 years old 10 per cent viable. Nearly 100 per cent of wheat seeds from 1 to 7 years old germinated. Similar results were obtained with seeds of rye, barley and oats.—*John W. Roberts.*

1133. Earle, F. S. **Varieties of sugar cane in Porto Rico.** Jour. Dept. Agric. and Labor, Porto Rico 3: 15-55. 1919.—One of the principal objects of this paper is to show that sugar cane varieties may be described, classified, keyed out and determined by ordinary methods of descriptive botany or taxonomy. Heretofore, remarkably few descriptions of the cane varieties have been published that would enable one to identify a variety. The cultural value and characteristics of the numerous varieties grown in Porto Rico are described in detail. A key for identification and a taxonomic description of a number of varieties is also contained in the article.—*Anthony Berg.*

1134. Evans, L. A. **Annual report of the acting-director of agriculture.** Tasmania Agric. and Stock Dept. Rept. 1918-19: 1-6. 1919.—Report giving statistics on production of principal crops. District reports are included.—*D. Reddick.*

1135. Fawcett, G. L. **The identity of canes grown in Argentina.** Internat. Sugar Jour. 22: 135-136. 1920.—The botanist of the Agricultural Experiment Station at Tucuman states that Java 36 is the true P. O. J. 36 as it is grown in Java today. The probable source of this incorrect designation is the description by Noel Deerr in his "Cane Sugar." Another inaccuracy is calling the variety J 228 (P. O. J. 228) by two names—its own and J 139, when in reality Java 228 is meant. Correspondence with the Java station and shipments of cane show that the Argentina canes of Javanese origin are identical with the varieties of corresponding names as grown in Java.—*E. Koch.*

1136. French, G. T. **Organization, development and activities of the Association of Official Seed Analysts of North America.** Proc. Assoc. Official Seed Analysts 1919: 15-20. 1919.

1137. Fruwirth, C. **Die Ansprüche der zur Körnergewinnung gebauten Lupinearten an Boden und Klima.** [The soil and climate requirements of lupine species grown for yield of seed.] Illustrierte Landw. Zeitg. 39: 199-200. 1919.—The soil and climate requirements of the following species are discussed: *Lupinus luteus, L. angustifolius, L. albus, L. cruikshanksii, L. mutabilis, L. hirsutus.*—*John W. Roberts.*

1138. Fruwirth, C. **Zur Frage des Verpflanzens der Luzerne.** [Concerning the question of transplanting alfalfa.] Illustrierte Landw. Zeitg. 39: 226. 1919.—Results obtained through three years of experimentation indicate that greater yields of forage and seed may be expected from a field in which the seed has been drilled in than from one in which a stand has been obtained by transplantation. The advantages and disadvantages of both methods are discussed.—*John W. Roberts.*

1139. Gajon, Carlos. **Cultivo del chicharo de vaca.** [Cultivation of the cowpea.] Rev. Agric. [Mexico] 5: 26-34. *5 fig.* 1919.—Explains the value of a green manure crop, the manner of fixation of nitrogen by legumes and outlines the culture of cowpeas, a green manure crop well adapted to Mexican conditions.—*John A. Stevenson.*

1140. Gammie, G. A. **Report of the imperial cotton specialist.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 115-124. 1919.—The report summarizes the qualities of some of the various varieties of cotton grown in India, and outlines experiments either in progress or contemplated to improve the cotton yield.—*Winfield Dudgeon.*

1141. GARDNER, H. A. **Research in the paint industry.** Sci. Amer. 122: 89. 1920.—Observations on the growing of soya beans and manufacturing of soya oil used in mixing paints.—*Chas. H. Otis.*

1142. GILLETTE, L. S., A. C. MCCANDLISH, AND H. H. KILDEE. **Soiling crops for milk production.** Iowa Agric. Exp. Sta. Bull. 187: 33-59. 1919.—This bulletin treats of the utilization of soiling crops for milk cows, discussing in this connection alfalfa, red clover, alsike, sweet clover, field peas, cowpeas, soy beans, maize, oats, rye, foxtail millet, sweet sorghum, Sudan grass, and the following mixtures: oats and peas, oats and vetch, barley and peas, rye and hairy vetch, cowpeas and corn, cowpeas and sorghum, clover and timothy. A résumé of work by other investigators is added.—*C. V. Piper.*

1143. GOSS, W. L. **Greenhouse and germination-chamber tests of crimson clover seed compared.** Proc. Assoc. Official Seed Analysts 1919: 64. 1919.—The results of 164 comparative and simultaneous germination tests of crimson clover seed, made between folds of blotting paper and in the greenhouse in soil gave results as follows: "The average of these 164 samples in the germinator was 50 per cent. The average germination of these same samples tested in soil in the greenhouse was 42 per cent."—*M. T. Munn.*

1144. GRIFFITHS, DAVID. **Prickly pear as stock food.** U. S. Dept. Agric. Farmers' Bull. 1072. *24 p. 8 fig.* 1920.

1145. GUTHRIE, F. B., AND G. W. NORRIS. **Note on the classification of wheat varieties.** Agric. Gaz. New South Wales 31: 243-244. 1920.—Classification based on milling values.—*L. R. Waldron.*

1146. HADLINGTON, JAMES. **Poultry Notes. February.** Agric. Gaz. New South Wales 31: 137-141. 1920.—Notes on growing alfalfa, *Medicago sativa.*—*L. R. Waldron.*

1147. HANSEN, W. **Degeneration und Saatgutwechsel. [Degeneration and seed variation.]** Illustrierte Landw. Zeitg. 39: 558-560. 1919.—The writer discusses the degeneration in the yield and quality of various field crops and strongly advises seed selection as a remedy therefor.—*John W. Roberts.*

1148. HARRINGTON, GEO. T. **Comparative chemical analyses of Johnson grass seeds and Sudan grass seeds.** Proc. Assoc. Official Seed Analysts 1919: 58-64. 1919.—A brief account of the results of comparative microchemical and permeability studies, also, gross chemical analyses of the seeds of these two closely related grass plants are given. These studies were made to determine whether there are any differences in their chemical nature, which might serve as a basis for explaining their marked difference in dormancy, germinating and afterripening.—*M. T. Munn.*

1149. HARRISON, W. H. **Report of the Imperial Agricultural Chemist.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 35-45. 1919.—See Bot. Absts. 5, Entry 2271.

1150. HAYWOOD, A. H. **Elephant, Para, and Guinea grasses at Wollongbar.** Agric. Gaz. New South Wales 31: 6. 1920.—Growth results given for *Pennisetum purpureum, Panicum muticum* and *P. maximum,* respectively. Elephant grass gave largest bulk of feed, was drought resistant and stimulated milk yields. Para grass covered the ground forming succulent feed, which remained green throughout the winter.—*L. R. Waldron.*

1151. HEIDUSCHKA, A., AND S. FELSER. **Beitrag zur Kenntnis der Fettsäuren des Erdnussöles. [Fatty acids of peanut oil.]** Zeitschr. Untersuch. Nahrungs.- u. Genussmittel 38: 241-265. 1919.—The composition of the fatty acids of the peanut oil examined was: Arachidic 2.3 per cent, Lignoceric 1.9 per cent, Stearic 4.5 per cent, Palmitic 4.0 per cent, Oleic 79.9 per cent, Linoleic 7.4 per cent.—*H. G. Barbour.*

1152. Helweg, L. **Sale of Danish root seed with guarantee for genuineness.** Seed World 7: 24-26. 1920.—This article deals with the Danish methods of growing seeds of carrots, mangels, rutabagas, and turnips and the guaranteeing of the genuineness of the varieties and strains, a method now adopted by nine of the important seed dealers.—*M. T. Munn.*

1153. Hilgendorf, F. W. **Methods of plant breeding.** New Zealand Jour. Agric. 19: 354-358. 1919.—The work of several investigators is briefly reviewed and the conclusion drawn that simple selection for the improvement of self fertilised plants, such as wheat, is not considered as very hopeful.—*N. J. Giddings.*

1154. Hillman, F. H. **Rhode Island bent seed and its substitutes in the trade.** Proc. Assoc. Official Seed Analysts 1919: 64-68. 1919.—In this paper the author reports recent investigations which show that there are certain seed characteristics peculiar to each of the species, by means of which the kinds of seed may be distinguished and to a certain extent their true proportions in a mixture determined. The source of the seed, shown or indicated by the kinds of weed seeds and extraneous crop seeds present, is also an aid in determining the kind of seed and liability of mixture due to condition of growth and trade practice. Attention is directed by the author to detailed and illustrative descriptions of the seeds of bent grasses found in Bulletin 692, Professional Series, U. S. Department of Agriculture.—*M. T. Munn.*

1155. Hite, Bertha C. **Forcing the germination of bluegrass.** Proc. Assoc. Official Seed Analysts 1919: 53-58. 1919.—Experiments designed to ascertain the effect of light, temperature, and nutrient solutions on the germination of Kentucky bluegrass and Canada bluegrass are discussed. The experiments lead to the conclusions that: A complete viability test of Kentucky blue grass can be obtained in the dark with an exact 20°-30°C. alternation. Under constant temperature conditions this grass gives a higher germination in the light.—An alternation of 20°-30°C. in a dark chamber does not give a complete viability test of Canada bluegrass.—Direct sunlight or diffuse light a few hours each day with approximately a 20°-30°C. alternation gives a complete viability test of both Canada blue grass and Kentucky bluegrass. -Nutrient solutions with 20°-30°C. alternation in the dark give a complete viability test of both Kentucky bluegrass and Canada bluegrass.—So far we have not been able to find an alternation of temperature alone that would give a complete viability test of all samples of Canada bluegrass.—*M. T. Munn.*

1156. Hodson, Edgar A. **Upland long staple cotton in Arkansas.** Arkansas Agric. Exp. Sta. Circ. 49: 1-4. 1920.—The conditions under which upland long staple cotton varieties may be expected to produce a profitable crop are given together with a map showing the regions suited to the culture of long staple, intermediate, and short staple cottons.—*John A. Elliott.*

1157. Hodson, Edgar A. **Cotton Club manual.** Arkansas Agric. Exp. Circ. 84: 1-26. *11 fig.* 1920.—A popular manual covering the history, physiology, histology, culture, and use of the cotton plant.—*John A. Elliott.*

1158. Hodson, Edgar A. **Lint frequency in cotton with a method for determination.** Arkansas Agric. Exp. Sta. Bull. 168: 1-12. 1920.—Lint frequency was determined for 100 seed samples from 10 plants each of 25 varieties of cotton under test. The length of lint was determined, also the percentage of lint by weight. The seed was delinted with sulphuric acid and the volume determined by displacement in alcohol. The weight of lint of a uniform length of 25 mm. was calculated to give an accurate comparison of weight of lint produced per square centimeter of seed surface. The lint index for a plant represents the average amount of lint produced on one seed. Six tables are given showing the lint index, lint percentage, lint length, and lint frequency of the varieties studied.—"High lint frequency is closely correlated with short lint, therefore, it is necessary in making selections for high lint frequency to consider length and per cent of lint."—*John A. Elliott.*

1159. HOWARD, A., AND G. L. C. **Report of the Imperial Economic Botanist.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 46-67. *Pl. 5-6.* 1919.—The report includes a summary of the progress of investigations during the year under report, a program for 1919-20, and a list of literature published. Improved wheats (*Triticum vulgare*) "Pusa 4" and "Pusa 12" have produced yields of 3350 pounds and 3000 pounds respectively per acre, under good cultivation, in contrast with the very low yields of ordinary Indian wheats under Indian methods of cultivation. These improved wheats are being sent to other countries for trial. Other work includes methods of culture and improvement of indigo (*Indigofera tinctoria*); sun-drying of vegetables; methods of packing fruit for shipment; pollination of Indian crop plants; and soil drainage. Poor drainage in the Gangetic Plains during the monsoon interferes with proper root development and promotes excessive denitrification. Actual crop production under improved methods of cultivation indicate that with small expenditure of organic fertiliser the fertility of alluvial soils may be maintained or improved.—*Winfield Dudgeon.*

1160. HOWE, H. E. **The future of the cotton industry. What organized research promises to do for grower and manufacturer.** Sci. Amer. 122: 300. 1920.

1161. HUTCHINSON, C. M. **Report of the Imperial Agricultural Bacteriologist.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 106-114. 1919.—See Bot. Absts. 5, Entry 2282.

1162. HYDE, W. C. **Orchard cover-crop experiments on the Mountere Hills.** New Zealand Jour. Agric. 19: 364-365. *1 fig.* 1919.—This is the final report of a 4-year series of experiments. Oats made a good growth and oats with partridge peas were particularly good. Blue lupine was the best of the legumes and it made much the strongest growth on limed area.—*N. J. Giddings.*

1163. JONES, EARL. **Northern grown seed wins in Massachusetts.** Potato Mag. 2[9]: 24, 29. 1920.

1164. JORDAN, W. H., AND G. W. CHURCHILL. **An experience in crop production.** New York Agric. Exp. Sta. [Geneva] Bull. 465. *20 p.* 1919.—An account of an experiment in which a 4-year rotation of crops (corn, oats, wheat, and hay) was carried through four rotations on plats fertilized in different ways—with farm manure, a complete chemical fertiliser, a partial chemical fertilizer, and no fertilizer. On some plats the hay crop was red clover; on others, timothy. The total amount of dry matter produced was somewhat greater on plats treated with farm manure than on plats receiving a complete chemical fertilizer; and about 56 per cent greater than on unfertilized plats. Especially noteworthy is the fact that crop production was maintained as efficiently on the timothy plats as on clover plats. The results of a series of soil analyses made in connection with the experiment show the unreliability of soil analysis as a means of measuring soil fertility.—*F. C. Stewart.*

1165. JOVINO, S. **Osservazioni sull'aridocoltura italiana. [Observations upon dry farming in Italy.]** Staz. Sper. Agr. Ital. 52: 69-121, 125-192. 1919.—See Bot. Absts. 5, Entry 2328.

1166. KELLOGG, JAMES W. **Seed report, 1918.** Bull. Pennsylvania Dept. Agric. 2[3]: 1-29. *5 pl.* 1919.—The bulletin includes a table giving standards of purity for various seeds; results of tests on special samples; average purity of official samples; results of inspection and analyses in tabular form; and illustrations of the noxious weed seeds found in farm seeds.—*C. R. Orton.*

1167. KELLOGG, JAMES W. **Seed report, 1920.** Bull. Pennsylvania Dept. Agric. 3[4]: 1-28. 1920.—Standards of purity established by the Seed Law for 20 kinds of seeds are given; also the results of special samples tested for purity; the average purity of official samples and the results of inspection are discussed and the data arranged in tabular form.—*C. R. Orton.*

1168. KERLE, W. D., AND R. N. MAKIN. **Farmers' experiment plots. Winter fodder trials, 1919.** Agric. Gaz. New South Wales 31: 77-83. 1920.—In the Upper North Coast dis-

trict, trials of cereals and legumes with and without fertilizers were carried out by a number of farmers. Results showed the practice to be successful. In the South Coast district cereals were tried without manures, with success.—*L. R. Waldron.*

1169. Killer, J. **Über die Bewertung der Centaurea solstitialis als Charakterbegleitsame bei der Herkunftsbestimmung von Kleesaaten. [Concerning the value of Centaurea solstitialis as an indicator of the origin of clover seed.]** Jour. Landw. 67: 109–110. 1919.—*Centaurea solstitialis* has long been recognized as indicating a southern European origin of clover seed. As this plant in recent years has been growing in Alsace in increasing abundance its seed may also be found in clover seed from there.—*C. E. Leighty.*

1170. Koerner, W. F. **Auf welche Krankheitsformen ist beim "Durchsehen" und "Aushauen" der zur Saatgewinnung bestimmten Kartoffelfelder besonders zu achten. [What diseases are to be considered especially in going through and thinning out potato fields from which seed potatoes are to be selected.]** Illustrierte Landw. Zeitg. 39: 323–324. *Fig. 258–259.* 1919.

1171. Lansdell, K. A. **Some common adulterants found in agricultural seeds. I.** Jour. Dept. Agric. Union South Africa 1: 26–31. *Plates II–IV.* 1920.

1172. Lewis, A. C., and C. A. McLendon. **Cotton variety tests.** Georgia State Bd. Entomol. Circ. 29. *20 p.* 1920.—Outlines tests with twenty-eight varieties of cotton (Gossypium) for 1919 conducted in the following Georgia counties: Sumter, Stewart, Dooley, Burke, Wilks, Douglas and Habersham. In each test, from ten to twenty varieties were used. Summaries of the various tests and recommendations of the varieties for different sections and under different conditions are given. Lists are appended of coöperative cotton growers and of parties from whom cotton seed may be purchased.—*T. H. McHatton.*

1173. Macpherson, A. **Lucerne growing for seed.** New Zealand Jour. Agric. 19: 369–371. 1919.—This article discusses the preparation of the seed bed, general cultural methods, weather conditions, harvesting the seed crop, etc. Conclusions are drawn that good crops of lucerne seed may be produced on well drained soil of average fertility. Very rich land and soil supplied with an abundance of moisture produce herbage rather than seed. Thick stands of lucerne are not favorable for good seed production. During the period devoted to the seed crop, two crops of hay may be taken from thick stands, which will be found of more profit. Old stands that are thinning out will often produce good crops of seed. The best practice for seed production is to establish a special wide-spaced stand by sowing the seed in rows 28 inches or more apart and cultivating two or three times.—*N. J. Giddings.*

1174. Macpherson, A. **Lucerne-culture tests at Ashburton Experimental Farm.** New Zealand Jour. Agric. 19: 288–293. 1919.—Experiments were conducted to indicate the proper amount of seed; the best method of sowing, and the effects of lime and fertilizers. As a result of these tests it is recommended: Seed should be sown in drills from 14 to 21 inches apart, to admit of cultivation; that not less than 15 pounds of seed per acre should be used; and that lime should be used, but not fertilizers.—*N. J. Giddings.*

1175. Maiden, J. H. **Chats about the prickly pear. No. 1.** Agric. Gaz. New South Wales 31: 117–120. 1920.—A brief historical survey of *Opuntia* spp. as an Australian pest is presented.—*L. R. Waldron.*

1176. Maiden, J. H. **Chats about the prickly pear. No. 2.** Agric. Gaz. New South Wales 31: 195–199. 1920.—Remarks on possible minor uses of *Opuntia* spp.—*L. R. Waldron.*

1177. McDiarmid, R. W., and G. C. Sparks. **Farmers' experiment plots. Potato experiments, 1918–19.** Agric. Gaz. New South Wales 31: 37–42. 1920.—Yields are given for different varieties in the New England district and the southwestern slopes at different points, with different manures and for different cultural methods. Artificial manures proved to be valuable.—*L. R. Waldron.*

1178. McDIARMID, R. W. **Grain sorghums in northern districts.** Agric. Gaz. New South Wales 31: 17–18. 1920.—Satisfactory results were obtained at Pallamallawa and Tenterfield with 5 varieties of *Andropogon sorghum*, used both as green feed and for grain production. The maximum yield of grain was 28 bushels per acre from Kaoliang, which was also the earliest variety.—*L. R. Waldron.*

1179. McKAY, J. W. **Assam Experiment Station.** Rept. Karimganj Agric. Exp. Sta. 1918–19: 1–16. 1919.—Annual report of Director of the Assam Experiment Station, recording progress in methods of cultivation and selection of promising varieties of commonly cultivated field crops.—*Winfield Dudgeon.*

1180. MENGES, FRANKLIN. **Report on soils and crops.** Bull. Pennsylvania Dept. Agric. 1: 111–114. 1918.—Some brief considerations of the conditions favoring the conservation of food materials in the soil and what may be expected by a proper supplementation of them.—*C. R. Orton.*

1181. MIEGE, E. **Le desinfection du sol.** [The disinfection of the soil.] Prog. Agric. et Vitic. 74: 133–140. 1920.—See Bot. Absts. 5, Entry 2284.

1182. MIÈVILLE, R. **Note sur le théier sauvage du Phou-Sang Région du Tranninh (Haut-Laos).** [Note on the wild tea of Phou-Sang.] Bull. Agric. Inst. Sci. Saigon 2: 87–99. 1920.

1183. MITSCHERLICH, EILH. ALFRED. **Zum Gehalt der Haferpflanze an Phosphorsäure und seinen Beziehungen zu der durch eine Nährstoffzufuhr bedingten Ertragserhöhung.** [On the phosphoric acid content of the oat plant and its relation to the increased yield resulting from addition of nutrients.] Jour. Landw. 67: 171–176. *1 fig.* 1919.—The law which Pfeiffer and others believe they have established is not confirmed by these investigations.—*C. E. Leighty.*

1184. MÜNTER, DR. **Pflanzenanalyse und Düngerbedurfnis des Bodens.** [Plant analysis and fertilizer requirement of the soil.] Jour. Landw. 67: 229–266. 1919.—See Bot. Absts. 5, Entry 2275.

1185. MYERS, C. H. **The use of a selection coefficient.** Jour. Amer. Soc. Agron. 12: 106–112. 1920.—See Bot. Absts. 5, Entry 1590.

1186. NELSON, MARTIN, AND L. W. OSBORN. **Report of oats experiments 1908–1919.** Arkansas Agric. Exp. Sta. Bull. 165. *32 p., 2 pl.* 1920.—Thirteen tables are given showing yields of 45 varieties of fall seeded and spring seeded oats under different dates of sowing and different rates of seeding. Tests were carried on in different sections of the state upon various types of soil. Recommendations are made of varieties adapted to different sections of the state and as to the cultural methods to be followed.—*John A. Elliott.*

1187. NELSON, MARTIN, AND EDGAR A. HODSON. **Varieties of cotton, 1919.** Arkansas Agric. Exp. Sta. Bull. 166. *8 p.* 1920.—Five tables are given showing the rank in seed cotton, lint production, seed production, and value of lint per acre of from 8 to 25 varieties, tested in various parts of the state, on different types of soil.—*John A. Elliott.*

1188. OLIVARES, DANIEL. **Cultivo del lupulo.** [Cultivation of hops.] Revista Agric. [Mexico] 3: 374–378. *Ibid.* 4: 12–16, 62–64. *2 fig.* 1919.—An account of the importance and possibilities of hops as a crop in Mexico giving details, botanical description, varieties, cultivation, fertilizers, manner of harvesting and yields.—*John A. Stevenson.*

1189. ORTIZ, RUBEN. **Rotacion y alternacion de los cultivos.** [Rotation and alternation of crops.] Jalisco Rural [Mexico] 2: 61–64. 1920.—Popular résumé of reasons for crop rotations. A series of rotations suitable for Mexican conditions is given.—*John A. Stevenson.*

1190. OSWALD, W. L. **Coöperation between the seed analysts and the seed trade.** Proc. Assoc. Official Seed Analysts 1919: 38–41. 1919.

1191. PAMMEL, L. H., AND C. M. KING. **An annual white sweet clover.** Proc. Iowa Acad. Sci. 25: 249-251. *Pl. 4-6.* 1920.—Origin and history of an annual strain of Melilotus alba found at Ames, Iowa.—*H. S. Conard.*

1192. PAMMEL, L. H., AND C. M. KING. **Test your clover and timothy seed.** Iowa Agric. Exp. Sta. Circ. 59. *2 p.* 1919.

1193. PAMMEL, L. H., AND C. M. KING. **Johnson grass as a weed in southwestern Iowa.** Iowa Agric. Exp. Sta. Circ. 55. *4 p., 3 fig.* 1919.—Johnson grass has become established in southern Iowa, and promises to become a menace to the farmers. A brief discussion is given, including a botanical description of the grass and seed, together with methods of extermination.—*Florence Willey.*

1194. PAVONI, P. A. **El cultivo de la higuerilla.** [Cultivation of the castor bean.] Jalisco Rural [Mexico] 2: 41-45. 1919.—A compiled account of the cultivation of the castor bean.—*John A. Stevenson.*

1195. PIEPER, H. **Beschreibung einer Methode zur raschen Erkennung von Futterrübensamen im Zuckerrübensamen.** [The description of a method for rapid differentiation between stock beet seed and sugar beet seed.] Zeitschr. Vereins Deutsch. Zucker-Indust. 766: 409-418. 1919.

1196. PITT, J. M. **Farmers' experiment plots. Winter green fodder exepriments, 1919.** Agric. Gaz. New South Wales 31: 7-12. *5 fig.* 1920.—Soiling crops are recommended for winter and spring in the Central Coast district, as dry weather invariably occurs. Cultural details and yield results are given for 10 localities (or less) for 8 varieties of wheat, 5 of oats and vetches and peas in combination with wheat or oats. The maximum yield of over 21 tons was secured from Thew wheat and peas.—*L. R. Waldron.*

1197. PITT, J. M., AND R. W. MCDIARMID. **Farmers' experiment plots. Maize experiments, 1918-19.** Agric. Gaz. New South Wales 31: 99-105. 1920.—Different varieties, with and without phosphatic manures, were grown at various localities in the Central Coastal district. The use of manures generally showed profits. The Improved Yellow Dent gave a maximum yield of 125 bushels per acre. Light yields were secured in the Northern districts. —*L. R. Waldron.*

1198. POWERS, W. L., AND W. W. JOHNSTON. **The improvement and irrigation requirement of wild meadow and tule land.** Oregon Agric. Exp. Sta. Bull. 167. *44 p., 25 fig.* 1920.—There are more than 515,000 acres of wild meadow and tule land in eastern Oregon, the former comprising more than one-third of the irrigated area of the state. The chief vegetation in the peat swamps consists of tules and flags, mingled with wire grass and sugar grass, while the chief meadow grasses are redtop, blue-joint, meadow grass and wild clover. In the Chewaucan Basin alsike clover and timothy have yielded 3¼ tons an acre as compared to ¾ ton of native grass on adjoining land. Alfalfa in the Harney Basin has produced about 2 tons an acre, while native wild hay has averaged but ½ ton an acre. In the Fort Klamath region alsike clover and timothy have yielded more than double the amount of forage produced by native grasses. Results from 5 years experiments have shown that an average depth of 18 inches of water on the field could produce the maximum yield now obtained, while an average of 12 inches has given the largest yield per acre per inch of water used. The average cost for the production of wild hay has been nearly double that required for alsike clover and timothy. Marked increases in yield of alfalfa have been secured from an application of sulfur to swamp border soils.—*E. J. Kraus.*

1199. RAMSAY, J. T. **Is change of seed necessary in the cultivation of potatoes?** Jour. Dept. Agric. Victoria 17: 651-657. 1919.—The selection of home grown seed potatoes has given as good results as imported seed potatoes.—*J. J. Skinner.*

1200. RAVAZ, L. **Le nitrate d'ammoniaque.** [Ammonium nitrate.] Prog. Agric. et Vitic. 74: 33-34. *1 fig.* 1920.

1201. RINDL, M. **Vegetable fats and oils, II. Drying oils.** South African Jour. Indust. 3: 121-127. 1920.

1202. ROBBINS, W. W. **The organization of the Colorado seed laboratory.** Proc. Assoc. Official Seed Analysts 1919: 35-38. 1919.

1203. ROBBINS, W. W. **Research and seed testing.** Proc. Assoc. Official Seed Analysts 1919: 20-22. 1919.

1204. ROBIN, J. **Les différentes variétés de riz cultivées à la station de Cantho.** [The different varieties of rice cultivated at the Cantho station.] Bull. Agric. Inst. Sci. Saigon 2: 40-45. 1920.—Brief notes on the characters of 22 varieties of rice.—*E. D. Merrill.*

1205. SALMON, S. C. **Establishing Kanred wheat in Kansas.** Kansas Agric. Exp. Sta. Circ. 74. *16 p.* Aug., 1919.—Kanred wheat is a hard, red, winter wheat, resembling closely Turkey and Kharkof. It is resistant to winter killing, ripens early, yields more than any other commercial variety in Kansas and is very resistant to leaf rust and some forms of stem rust. It will probably be of commercial value in other states growing winter wheat.—*L. E. Melchers.*

1206. SANDERSON, T. **Value of Red Durum or D 5 wheat.** North Dakota Agric. Exp. Sta. Special Bull. 5: 507-517. 1920.—Deals with milling and baking values. There are presented coefficients of flour absorption, and also those for volume, color and texture of loaf. When these coefficients are applied to the data presented the D 5 wheat was found to be worth 23 cents per bushel less than No. 1 Amber Durum, and 38 cents less than No. 1 Hard Red Spring, for the years 1915-1919. The D 5 showed itself inferior in all loaf characters.—*L. R. Waldron.*

1207. SAYER, WYNNE. **Report of the Imperial Agriculturist.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 11-34. *4 pl.* 1919.—The report describes the results of experiments in crop rotation at the Agricultural Research Institute, Pusa, India, to determine the best methods of working the land of the Pusa farm, and field tests of new and improved varieties of commonly cultivated plants. A new variety of wheat (*Triticum vulgare*), "Hard Federation," stands up well in wind and rain, and yields up to 3300 pounds per acre.—*Winfield Dudgeon.*

1208. [SCHULE, N., AND H. L. MAXWELL.] **The oil in peanuts.** Sci. Amer. Monthly 1: 213. 1920. [Reprinted from Chemical News (London).]

1209. SCOTT, JOHN M. **Bahia grass.** Jour. Amer. Soc. Agron. 12: 112-113. 1920.—A report of the promise of Bahia grass (*Paspalum notatum*), which has been introduced into the United States from South America and Mexico. Experiments in Florida have given very satisfactory results.—*F. M. Scherts.*

1210. SPARKS, G. C. **Farmers' experiment plots. Potato experiments, 1918-1919.** Agric. Gaz. New South Wales 31: 251-254. 1920.—Different varieties were tried in several localities, with and without fertilizers. Fertilizers had a marked positive effect upon yield.—*L. R. Waldron.*

1211. SPARKS, G. C., B. C. MEEK, AND R. W. MCDIARMID. **Farmers' experiment plots. Wheat and oats experiments, 1919.** Agric. Gaz. New South Wales 31: 153-164. 1920.—Trials with wheat, also oats and barley, were carried out in three districts with a number of coöperators. The experiments dealt with the effect of fertilizing, early and late sowing, crop-harrowing, fallowing, rate of seeding and the effect of using graded and ungraded and acclimatized and unacclimatized seed. Yields and bushel weights of grain are given. Working the land after the rain gave growth and returns superior to that worked only prior to the rain and

while the land was dry. The value of the properly compacted seed bed was demonstrated in the long and short fallowing plots and the May preparation with the spring-toothed cultivator only. The use of superphosphate with a quick maturing variety on the long and short fallowed land is unnecessary. Good yields on the long fallow plainly demonstrated the value of that system.—*L. R. Waldron.*

1212. Stuckey, H. P. **Further studies in fertilizing and storing sweet potatoes.** Georgia Exp. Sta. Bull. 134: 77-87. 1920.—Bulletin 107 of the Georgia Experiment Station reports work on fertilizing sweet potatoes (*Ipomoea batatas*) which was begun in 1908, the first report being published in 1913. This Bulletin reports on the same work from 1914–1919 inclusive. The area utilized for the plats is Cecil clay loam, and the same kinds and amounts of fertilizer have been applied to the same plats from 1908 to 1919 inclusive. Plat No. 1, fertilized at the rate of 24 tons of stable manure per acre; plat No. 2, 2100 pounds 16-per-cent acid phosphate per acre; plat No. 3, 900 pounds sulphate of potash per acre; plat No. 4, 1500 pounds nitrate of soda per acre; plat No. 5, 1800 pounds of complete fertilizer. Results show that acid phosphate and sulphate of potash have increased the acidity of the soil. The complete fertilizer gave the largest total yield throughout the period of the test, stable manure coming second. Heavy nitrogenous fertilization seemed to give potatoes a lighter color and somewhat poorer flavor. The variety of sweet potatoes used since 1913 has been Myers Early. The best quality potatoes were produced on the acid phosphate plat and the check. The potash seemed to have little influence in either color, flavor, or texture of the flesh. Potatoes from the experimental plats were tested in storage. Those from the check plat kept better through the winter than the others, but the data obtained were variable and a conclusion can hardly be drawn. In testing the influence of soil types on the keeping of sweet potatoes, potatoes grown on Cecil clay loam or red soil and on a gray phase of the Cecil clay loam were compared; it is concluded that under local conditions, potatoes grown on gray soil keep better than those grown on red soil. Potatoes from various plats were put in storage and loss of weight determined. The average loss of weight was 16.6 per cent. The loss of moisture from November 5th to March 1st was 3.73 per cent. The average total loss of weight was 16.6 per cent, and it is concluded that the percentage in loss of weight over the percentage of loss in moisture is doubtless due to the breaking down of carbohydrates and the giving off of carbon dioxide. In conclusion the author outlines a coöperative test on fertilizing sweet potatoes that is being carried on by several southern stations. It states results for one year. —*T. H. McHatton.*

1213. Syme, J. E. **Wheat plots at Narromine, 1919.** Agric. Gaz. New South Wales 31: 233-234. 1920.

1214. Syme, J. E. **Farmers' experiment plots. Wheat and oats experiments, 1919.** Agric. Gaz. New South Wales 31: 235-240. 1920.—Trials with wheat and oats were carried out with several coöperators with different varieties, under various cultural methods, with the use of manures, and with the use of home-grown and introduced seed. Yields of grain and wheat hay are given and rainfall data presented.—*L. R. Waldron.*

1215. Tabor, Paul. **Permanent pastures for Georgia.** Georgia State Coll. Agric. Bull. 197. *36 p., 16 fig.* 1920.—Discusses the following pasture plats in Georgia: Japan clover (*Lespedeza stricta*), Bermuda grass (*Cynodon dactylon*), carpet grass (*Axonopus compressus*), Dallis grass (*Paspalum dilatatum*), white clover (*Trifolium repens*), Rhodes grass (*Chloris gayana*), Kudzu (*Pueraria thunbergiana*), bur clover (*Medicago arabica*), black medic (*M. lupulina*), red top or herds grass (*Agrostis alba*), orchard grass (*Dactylis glomerata*), tall oat (*Arrthenatherum elatius*), rescue grass (*Bromus unioloides*), arctic grass (*Bromus secalinus*), rye grass (*Lolium* sps.), Kentucky blue grass (*Poa pratensis*), The Paspalums (*Paspalum sps.*), giant carpet grass (*Axonopus furcatus*), broomsedge (*Andropogon sps.*), Indian oats (*Chrysopogon nutans*), wild rye (*Elymus sps.*), wire grass (*Aristida stricta*), lightwood-knot grass (*Sporobolus curtissii*), crab grass (*Syntherisma sps.*), crow foot (*Dactyloctenium aegyptium*), cane brake (*Arundinaria tecta, A. macrosperma*), maiden cane (*Panicum hemitomum*),

smut grass (*Sporobolus berteroanus*), marsh bermuda (*Sporobolus virgatus*), Carolina clover (*Trifolium Carolinianum*), hop clover (*T. procumbens*; *T. dubium*).—Directions for soil preparation and seeding are presented by the author and also mixtures of grass seeds suitable for various soils of the state.—*T. H. McHatton.*

1216. TAYLOR, H. W. **Tobacco culture, grading on the farm.** Rhodesia Agric. Jour. 17: 20–27. 1920.

1217. TRAN-VAN-HUU. **Note sur la variété de riz dite "Hueky."** [**Variety of rice known as "Hueky."**] Bull. Agric. Inst. Sci. Saigon 2: 75–78. 1920.

1218. TRAN-VAN-HUU. **Note sur la culture du riz flottant en Cochinchine.** [**Cultivation of floating rice in Cochinchina.**] Bull. Agric. Inst. Sci. Saigon 2: 46–52. 1920.—Notes on ten varieties and a description of the methods used in growing these forms of the rice plant which are peculiarly adapted to inundation.—*E. D. Merrill.*

1219. VAGELER, H. **Beziehung zwischen Parzellengrösse und Fehler der Einzelbeobachtung bei Feldversuchen.** [**Relation between size of plot and error of the single observation in field experimentation.**] Jour. Landw. 67: 97–108. *1 fig.* 1919.—Rye, oats, potatoes, and kohlrabi fields were each divided into 128 small rectangular plots, of which the yields were separately determined. The probable errors of the average yields of these plots considered singly and in different combinations were calculated. Different results were obtained according to the method and procedure followed, but when using the method considered least objectionable the probable error is not greatly reduced by enlarging the plots above about 50 square meters. —*C. E. Leighty.*

1220. VERNET, G., AND X. SALOMON. **Notes sur le Fourcroya gigantea Vent.** [**Notes on Fourcroya gigantea Vent.**] Bull. Agric. Inst. Sci. Saigon 2: 80–87. *Pl. 2.* 1920.

1221. WALDRON, L. R. **First generation crosses between two alfalfa species.** Jour. Amer. Soc. Agron. 12: 133–143. 1920.

1222. WALSTER, H. L. **Marquis versus durum wheats.** North Dakota Agric. Exp. Sta. Ext. Div. Circ. 34. *8 p.* 1920.—Summary of North Dakota yields.—*L. R. Waldron.*

1223. WEEKS, CHARLES R. **Growing alfalfa in western Kansas.** Kansas Agric. Exp. Sta. Circ. 73. *10 p.* July, 1919.—Information is given on soil requirements, seed bed preparation, date, rate and method of seeding, nurse crops, cultivation, time of cutting, seed crops, varieties and insects injurious to alfalfa in Kansas.—*L. E. Melchers.*

1224. WELTON, F. A. **Experiments with oats.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 79–83. *7 tables.* 1920.—The article comprises tests of time, rate, manner, quality and varieties of seed.—*R. C. Thomas.*

1225. WENHOLZ, H. **Field peas as fodder. A substitute for wheat and oats.** Agric. Gaz. New South Wales 31: 167–170. 1920.

1226. WENHOLZ, H. **Soil improvement for maize. I. Manures and fertilizers.** Agric. Gaz. New South Wales 31: 29–35, 111–116, 117–183. 1920.

1227. WENHOLZ, H. **Fertilizers for green winter fodders.** Agric. Gaz. New South Wales 31: 241–242. 1920.

1228. WESTBROOK, E. C. **Tobacco culture. Bright leaf or flue-cured tobacco.** Georgia State Coll. Agric. Bull. 199. *56 p., 15 fig.* 1920.—Discusses a development in history of the bright tobacco (*Nicotiana tabacum*) industry in Georgia and considers advisability of increasing the crop. Discusses tobacco soils, crop rotation and general principles of tobacco culture,

beginning with the preparation of the plant bed, and including transplanting, cultivating, insect enemies and diseases. Outlines directions for harvesting and curing, as well as for storage. Gives plans and suggestions for storage barns and curing sheds.—*T. H. McHatton.*

1229. WILLEY, FLORENCE. **The vegetative organs of some perennial grasses.** Proc. Iowa Acad. Sci. 25: 341-367. *Fig. 121-144.* 1920.

1230. WILLIAMS, C. G. **Clipping tests of oats and wheat.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 20-23. *4 tables.* 1920.

1231. WINTERS, S. R. **Paper from cottonseed waste.** Sci. Amer. 122: 299. *2 fig.* 1920.

1232. WRIGHT, I. A. **The history of the cane sugar industry in the West Indies.** Louisiana Planter and Sugar Manufacturer 62: 414-415. *Ibid.* 63: 14-15, 108-109, 222-223, 237-239, 414-415. 1919.

1233. YOUNG, J. P. **Report of Committee on the Cereal Crops.** Bull. Pennsylvania Dept. Agric. 1[1]: 11-13. 1918.—A report of the acreage, average yield per acre, estimated total production, average price per bushel, and estimated total value of the wheat, corn, rye, oats, buckwheat, potatoes, tobacco and hay crops in Pennsylvania for the year 1917. A comparative table with the yields per acre in 1916 is also given.—*C. R. Orton.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

LINCOLN W. RIDDLE, *Editor*

1234. ANONYMOUS. **Brief account of the life and works of Reginald Philip Gregory.** Jour. Botany 57: 47. 1919.

1235. ANONYMOUS. **C. S. Harrison.** Florists' Exchange 47: 413. *1 fig.* 1919.

1236. ANONYMOUS. **William J. Stewart.** Florists' Exchange 47: 413. *1 fig.* 1919.

1237. ANONYMOUS. **Lewis S. Ware 1851-1918.** Internat. Sugar Jour. 21: 113. *1 pl.* 1919.—LEWIS S. WARE, the distinguished sugar engineer, publisher, and author, of Philadelphia and Paris, made a special study of sugar beet industry and attempted unsuccessfully to establish it in the United States in 1873. In 1879 he established at Philadelphia a monthly publication, *The Sugar Beet*, which continued for 32 years. He also published pamphlets and books, his principal work being "Beet Sugar Manufacture and Refining," which is one of the standard works on this subject. Dr. Ware collected a sugar library of 12,000 volumes, which he has bequeathed to the Franklin Institute of Philadelphia.—*C. Rumbold.*

1238. BAKER, C. F. **A contribution to Philippine and Malayan technical bibliography. Work fundamental to plant pathology and economic entomology.** Philippine Agric. 8: 32-37. 1919.—This bibliography gives mycological and entomological publications, each of which is based wholly or in part on the field results of the compiler, in the Philippines and Malaysia, during the period from 1913 to 1918, inclusive. The object of the index is to aid the investigator in obtaining the literature on these subjects, and to illustrate the great value of cooperation between scientists.—*S. F. Trelease.*

1239. BIGGAR, H. HOWARD. **The old and the new in corn culture.** U. S. Dept. Agric. Yearbook 1918: 123-137. *4 pl., 10 fig.* 1919.—See Bot. Absts. 4, Entry 28.

1240. BRITTEN, JAMES. **Bibliographical notes. LXXVI.—Henry W. Burgess's "Eidodendron."** Jour. Botany 57: 223-224. 1919.—A review of this work published in London in 1827 and bearing the full title "EIDODENDRON: Views of the general character and appearance of Trees, foreign and indigenous, connected with Picturesque Scenery." The work is of

little or no botanical interest. Its only interest to the botanist is in connection with an essay headed "Botanical Diversions 1" followed by a large title "Amoenitates Quernese." Here is included a comprehensive account of the oak in literature, history, poetry and commerce. The author of this essay was probably a more competent man than BURGESS. GILBERT BURNETT is often cited as the probable author. [See also next following Entry, 1241.]—*K. M. Wiegand.*

1241. BRITTEN, JAMES. **Bibliographical notes, LXXVII. John Ellis's directions for collectors.** Jour. Botany 57: 521. 1919.—This is an analysis of a damaged copy of this work published in 1771, which has lately been presented to the Department of Botany of the British Museum. It is entitled "Directions for bringing over Seeds and Plants from the East-Indies and other distant Countries in a State of Vegetation" and is anonymous. It proves to be a reissue of the first portion of the pamphlet published in 1770 by JOHN ELLIS, with some additional matter included. [See also next preceding Entry, 1240.]—*K. M. Wiegand.*

1242. COCKAYNE, L. **Presidential address.** New Zealand Jour. Sci. Technol. 2: 241–251. July, 1919.—Address delivered before the New Zealand Institute Science Congress, at Christchurch, 1919. Traces briefly the history of the New Zealand Institute, its activities, publications, equipment, influence, and aims. Urges the public support, financial and otherwise, of research in "pure" science, whether or not the given investigation has "an evident practical bearing." Notes the need of research in New Zealand in plant physiology and plant diseases.—*C. S. Gager.*

1243. FARR, BERTRAND H. **The peony and its people—from amateur to professional.** Flower Grower 6: 102. 1919.—References to the modern varieties of the peony and personal glimpses of those who produced them.—*W. N. Clute.*

1244. GAGNEPAIN, F. **Édouard Bureau. Sa vie et son oeuvre.** [Life and work of Édouard Bureau.] Rev. Gén. Bot. 31: 209–218. *Portrait.* 1919.—Edouard Bureau (1830–1918), entomologist, geologist and botanist, had a part in founding La Société Botanique de France. In 1874 A. DE JUSSIEU'S chair of plant classification at the Paris Museum was reëstablished, and BUREAU was selected to occupy it. In this position he worked for more than 30 years in augmenting the great herbarium, developing the colonial floras, establishing a permanent exhibition of vegetable products, studying the palaeobotanical collections of BRONGNIART, and presenting courses in the Museum. A list of Bureau's 158 botanical contributions is appended.—*L. W. Sharp.*

1245. GUINET, A. **Auguste Schmidely. Sa biographie.** [The biography of August Schmidely.] Bull. Soc. Bot. Genève 10: 377–379. 1918.—SCHMIDELY is known for his study of the genera *Rosa* and *Rubus*. The results of his study from plants collected in the Swiss Alps are published mostly in the bulletin cited. He was born Jan. 26, 1838, and died Oct. 28, 1918.—*W. H. Emig.*

1246. HOLM, THEO. **The history of the popular name "Flower De Luce" or "Fleur De Lis" of the Iris.** Rhodora 21: 180–181. 1919.—A short discussion of the derivation of this name. It appears to have been first applied to the yellow iris growing on the shores of the river Lys in Flanders. The derivation dates back to the year 468 when the Franks left Flanders to invade and conquer Gaul, establishing the kingdom of France. In commemoration of their birthplace they selected this flower for their emblem. The name "Fleur de Lys" is therefore an abbreviation of "Fleur de la Lys."—*James P. Poole.*

1247. LEE, A. ATHERTON. **Plant pathology in Japan.** Phytopath. 9: 178–179. 1919.—The development of plant pathology in Japan commenced with Dr. Shirai's lectures at the Agricultural College, Tokyo, in 1886. Eighty pathologists now have a thriving society which publishes a journal with articles in English, German and Japanese. The latter are abstracted in English.—*R. E. Vaughan.*

1248. Meyer, Rud. **Heinrich Poselger.** Monatsschr. Kakteenkunde 29: 97–100. 1919. —There is given an account of the life of Poselger, his travels in Mexico in 1849–51, and his death in 1883.—*A. S. Hitchcock.*

1249. Nelson, J. C. **A little known botanist.** Amer. Botany 25: 129–133. 1919.—Juan Loureiro born in Lisbon, 1715. At the age of 20, visited Cochin China and later collected extensively there and in China proper, Cambodia, Bengal, and Malabar. He published Flora Cochinchinensis in 1790, and various shorter works in Portuguese.—*W. N. Clute.*

1250. Nicholson, Wm. Edw. **A reminiscence of the late Dr. Emil Levier.** Bryologist 21: 85–86. 1918.—The author gives an account of an evening spent with Dr. and Mme. Levier, and tells about the methods used by Dr. Levier in mounting specimens.—*Edward B. Chamberlain.*

1251. Peacock, Josiah C. **Franklin Muhlenberg Apple, Ph.G., Phar. D. Memoir.** Amer. Jour. Pharm. 91: 546–550. 1919.

1252. Petch, T. **Garcia da Orta's mongoose plants.** Ceylon Antiquary and Literary Register 4[2]: 143–149. 1919.—Discussion of the three plants of Ceylon, alleged to have been used as an antidote of snake poison, and described by the Portuguese physician Garcia da Orta, who lived at Goa from 1534 to about 1570. The first of these plants, which the ichneumon of fable seeks in order to protect itself against the bite of the cobra, is *Rauwolfia serpentina.* The second of Orta's species, the wood of which was formerly sent to Europe as *Lignum colubrinum*, was identified by Linné with *Strychnos nux-vomica.* In the author's opinion it is *S. trichocalyx.* The third species, hitherto unidentified, is determined as *Hemidesmus indicus* (Singhalese *iramusu*). None of these plants appears to be in use as a remedy for snake bite at the present day, nor are they enumerated in the recipes for snake-bite remedies, twenty in number, which Hoatson collected in Uva in 1822.—*B. Laufer.*

1253. Prain, (Sir) David. **"John" Roxburgh.** Jour. Botany 57: 28–34. 1919.—A discussion of the identity of "Roxburgh, junior," alluded to in Dr. William Roxburgh's *Flora Indica.*—*K. M. Wiegand.*

1254. Sewell, M. C. **Tillage: a review of the literature.** Jour. Amer. Soc. Agron. 2: 269–290. 1919.—See Bot. Absts. 3, Entry 1883.

1255. Stringer, H. B. **George Arnold.** Florists' Exchange 48: 521. *1 fig.* 1919.

1256. Vaupel, F. **Aus der alten Kakteenliteratur.** [On old cactus literature.] Monatsschr. Kakteenkunde 29: 25–31, 49–54, 61–66, 115–120. *5 fig.* 1919.—The author translates chapters from an old Spanish work published in 1547, Coronica de las Indias, by Gonçalez Hernandez de Oaiedo y Valdes. Chapter 23 describes the Pitahaya fruit; chapter 24 describes a columnar cactus called torches; chapter 25 concerns tunas and their fruits; chapter 1 of book 10 deals with tree cactuses.—*A. S. Hitchcock.*

1257. Whelpley, Henry M. **James Michenor Good.** Amer. Jour. Pharm. 91: 447–452. *Pl. 1.* 1919.—A review and appreciation of the life and work of the late James Michenor Good, one of the landmarks in American Pharmacy.—*Anton Hogstad, Jr.*

1258. Williams, Emile F. **George Golding Kennedy.** Rhodora 21: 25–35. *1 pl.* 1919. —Biographical sketch of the late George Golding Kennedy.—*James P. Poole.*

1259. Winslow, E. J. **Early days of the American Fern Society.** Amer. Fern. Jour 9: 33–38. 1919.

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*
ALFRED GUNDERSEN, *Assistant Editor*

1260. BROWN, NELSON COURTLANDT. **The royal Italian forestry college.** Jour. Forestry 17: 807-812. 1919.—See Bot. Absts. 5, Entry 1303.

1261. CLUTE, WILLARD N. **Plant names and their meanings.—II. Ranunculaceae.** Amer. Bot. 26: 2-10. 1920.—The common names used for species of Ranunculaceae traced to their sources when possible.—*W. N. Clute.*

1262. CONARD, H. S. **The general classification of higher plants.** Proc. Iowa Acad. Sci. 25: 237-240. 1920.

1263. PAMMEL, L. A. **State parks in Iowa.** Sci. Monthly 10: 516-521. 1920.—The plan proposes the preservation of some of the forests for the pleasure and education of all the people.—The parks are of different kinds. Lake parks which include enough of all lake shores to conserve animal and plant life; along streams where these have cut through ridges as the Devil's Backbone, and the forests associated with these; ledges on which most of the ferns of the state are found; mounds, palisades and similar areas suggest the plans.—It is far-sighted wisdom on the part of the state to establish these parks to preserve to future generations the natural history and geology and historic features of Iowa.—*L. Pace.*

1264. S., E. J. [Rev. of: CHURCH, A. H. **Elementary notes on structural botany.** Oxford Botanical Memoirs No. 4. *87 p.* Oxford University Press, 1919.] Jour. Botany 58: 27. 1920.

CYTOLOGY

GILBERT M. SMITH, *Editor*
GEORGE S. BRYAN, *Assistant Editor*

1265. BALLS, W. LAWRENCE. **The existence of daily growth-rings in the cell wall of cotton hairs.** Proc. Roy. Soc. London B 90: 542-555. *Pl. 14-16.* 1919.—Cellulose wall of Egyptian cotton swelled to five or ten times normal size by treatment with NaOH and CS_2 showed concentric layering. Correlated with Egyptian field crop conditions where growth is arrested each afternoon. Only one thin primary layer formed while cell is growing in length. When thickening sets in it proceeds to a maximum of 25 layers.—*Paul B. Sears.*

1266. BEER, RUDOLPH, AND AGNES ARBER. **On the occurrence of multinucleate cells in vegetative tissues.** Proc. Roy. Soc. London B 91: 1-17. *Pl. 1.* 1919.—Lists species in which multinucleate cells have been recorded in vegetative tissues, together with region of plant involved. List includes 177 species in 60 families of vascular plants. Theory of previous workers regarding amitotic origin of such multinucleate phases is questioned. No clear example of amitosis observed but numerous cases of mitosis normal up to cell plate stage observed. Instead of normal cell walls formation after mitosis Kinoplasm forms a hollow sphere around nucleus—"phragmosphere." This gradually enlarges until coextensive with cell cytoplasm. Suggested that numerous nuclei render available for use of cytoplasm valuable material (a) by increased nucleus surface (b) in certain cases by nuclear disintegration and resorption.—*Paul B. Sears.*

1267. BUSCALIONI, L. **Nuove osservazione sulle cellule artificiali.** [Further observations on artificial cells.] Malpighia 28: 403-434. *Pl. 11-12.* 1919.—This is a description and discussion of experiments with colloidal films. The plates are from photomicrographs of the results of experiments and show not only simulation of cell-walls, but also simulation of nuclei with chromatin-reticulum.—*L. W. Riddle.*

1268. Legrand, L. **Une conception biologique nouvelle de la cellule. [A new biological conception of the cell.]** Rev. Gén. Sci. Pures et Appliquées 30: 13. 1919.—Nothing essentially new, but a good review of the present situation.—*G. J. Peirce.*

1269. Mangenot, M. G. **Sur l'évolution du chondriome et des plastes chez les Fucacées. [The evolution of the chondriosome and of the plastids in the Fucaceae.]** Compt. Rend. Acad. Sci. Paris 170: 63-65. *1 fig.* 1920.—In the apical cells of *F. vesiculosus* and *F. platycarpus* mitochondria are to be found at some of the protoplasmic anastomoses in the cytoplasm, while at other anastomoses small phaeoplasts appear and elsewhere in these cells there are grains of fucosane. The adjacent peripheral cells also contain mitochondria, grains of fucosane and phaeoplasts, the last named being larger, having more pigment and reacting in a different fashion to the fixing solutions than those of the apical cell. Small phaeoplasts occur not only in the apical cells, but also in the cells of the central axis cut off from the apical cell on its proximal face and in the initial cells of adventitious shoots. The cells containing small phaeoplasts are considered to be embryonal in character.—*C. H. and W. K. Farr.*

FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*
J. V. Hofmann, *Assistant Editor*

1270. Adler, Friedrick v. d. **Aus dem Kubani Urwald. [The Kubani virgin forest.]** Oesterreich. Forst.- u. Jagdzeitg. 38: 23. 1920.—A short popular description of an 80 hectar area of virgin timberland in Bohemia. Trees 1 meter to 1.9 meters in diameter are found in contrast to the small sizes generally found in cut over forests in the same region.—*F. S. Baker.*

1271. Aguilar, R. H., **The lumbang-oil industry in the Philippine Islands.** Philippine Jour. Sci. 14: 275-285. 1919.—Two kinds of lumbang nuts occur in the Philippines, lumbang bato (Aleurites moluccana) and lumbang banucalag (Aleurites trisperma), but when the word lumbang is employed it is taken to mean lumbang bato. The Bureau of Forestry is encouraging planting of the trees so that a sufficient supply of raw material may be assured. The nuts may be stored for a year or more without depreciable change. The oil is used in the calking of vessels, manufacture of soft soap, and in the manufacture of paints. The kernels may be separated from the shells and the oil expressed, or the whole nut ground up and the oil separated. The former is slower and more laborious but furnishes a larger percentage of oil and a cake of higher fertilizing value. The oil may be kept satisfactorily in copper containers.—*Albert R. Swertser.*

1272. Ammon, W. **Ueber die Pflicht zum Unterholt subventionierter Aufforstungs und Verbauungs-Projekte. [The obligation to maintain subsidized forestation and construction projects.]** Schweiz. Zeitschr. Forstw. 71: 105-114. 1920.—One of the difficulties in maintaining a subsidized project is the change of ownership. When a change of title occurs the new owner accepts the subsidy as an obligation and fulfills it in so far as it is compulsory. Under the laws of Berne the acquisition of land carries with it the obligation to protect and continue any subsidized project although other cantons do not adequately provide for change of title. —A subsidy may consist of either a fixed sum or a per cent of the project undertaken. The State or Canton must have preference in the arrangement because in the event of non-fulfillment the project must be continued by the State or Canton.—Non-utilization of a tract for timber production or grazing constitutes a non-fulfillment of a subsidy agreement and leaves the present incumbent subject to a fine.—The regulations are still somewhat confused and it is recommended that the obligations of the State and land owner be more specifically defined and incorporated in the laws.—*J. V. Hofmann.*

1273. Anderson, J. **Ecuador contributes a wood that is lighter than cork.** Sci. Amer. 122: 281. *2 fig.* 1920.—Concerns *Ochroma lagopus*, balsa wood.—*Chas. H. Otis.*

1274. ANONYMOUS. **Annual return of statistics relating to forest administration for the year 1917-18, British India.** *25 p., 1 diagram.* Simla, 1919.—The report contains summarised tabulated data on forest areas, improvement, protection, fires, grazing, planting, exports, expenditures, revenues, and other subjects for all the provinces. The present forest area under control of the Forest Department is 251,512 square miles or 23.3 per cent of the total area of all the provinces; 60,724 square miles, or 24 per cent of the forest area, are under approved working plans. 46.3 per cent of the entire forest area was under fire protection and 47,249 square miles, or 18.8 per cent, was entirely closed to grazing during the year. The financial statement shows a total revenue of 40,969,257 Rs, expenditure 21,157,063 Rs, leaving a surplus (cumulative) of 19,812,194 Rs. A final table gives the state of the finances by periods and years from 1869 to 1918, and the appended diagram shows graphically the relation of revenue, expenditure and surplus for the past ten years.—*E. R. Hodson.*

1275. ANONYMOUS. **Automatic regulation of humidity in factories.** Sci. Amer. Monthly 1: 24-28. *6 fig.* 1920.—An article of interest to manufacturers of articles made from wood.—*Chas. H. Otis.*

1276. ANONYMOUS. **Effect of decay on wood pulp.** Sci. Amer. Monthly 1: 247. 1920.

1277. ANONYMOUS. **Fliegertätigkeit im Dienste des Forstschutzes. [The use of air planes in forest protection.]** Schweiz. Zeitschr. Forstw. 71: 82-83. *2 pl.* 1920.—Photographs taken from airplanes may be used for classification of areas in suitable regions for grazing, etc., also for topographic features and boundary locations of permanent forest areas. Photographs taken on a scale 1:25,000 bring out a great deal of detail. Often aerial patrol may bring out features that would be lost otherwise, such as snowslides and landslides in the initial stages. Taken in time, these may be prevented.—*J. V. Hofmann.*

1278. ANONYMOUS. **Forests in Japan.** Amer. Forestry 26: 95. 1920.

1279. ANONYMOUS. **Fra Dansk Skovforening. Handel og Priser i 1918-19. [Business and prices, 1918-19.]** Dansk Skovforenings Tidsskr. 4: 453-489. 1919.

1280. ANONYMOUS. **Fuel value of wood.** Sci. Amer. Monthly 1: 425. 1920.

1281. ANONYMOUS. **Holz als Ersatz der Kohle bei der Gaserzeugung. [Wood as a substitute for coal in gas production.]** Oesterreich. Forst.- u. Jagdzeitg. 38: 23. 1920.—Owing to the scarcity of coal in Zürich (Switzerland) wood was used in some of the retorts to eke out the coal supply. Mixtures of green cherry, oak, beech, alder, ash, willow, chestnut, hazel, birch were used. A yield of 27.5 per cent of gas was obtained of good quality running 29.2 per cent of hydrogen, 10.3 per cent methane and 2.9 per cent heavy hydrocarbons.—*F. S. Baker.*

1282. ANONYMOUS. **Jaegersborg Dyrehave. [The game reserve at Jaegersborg.]** Dansk Skovforenings Tidsskr. 4: 4-8. 1919.

1283. ANONYMOUS. **Kiln drying of green hardwoods.** Sci. Amer. Monthly 1: 247. 1920.

1284. ANONYMOUS. **Lead pencils.** Sci. Amer. Monthly 1: 286. 1920.

1285. ANONYMOUS. **Lumber salvage in France.** Sci. Amer. 122: 105. 1920.

1286. ANONYMOUS. **Made of wood.** Sci. Amer. 122: 55. 1920. Some of the strange uses of wood and its by-products, as displayed in an exhibit prepared by the New York State College of Forestry.—*Chas. H. Otis.*

1287. ANONYMOUS. **Paper famine if forests are wasted.** Amer. Forestry 26: 94-95. 1920.

1288. ANONYMOUS. **Sodium fluoride as a wood preservative.** Sci. Amer. Monthly 1: 258. 1920.

1289. Anonymous. **The Southern Forest Conference.** Sci. Amer. Monthly 1: 286. 1920. —Notes on the meetings held in New Orleans, beginning Jan. 28, 1920.—*Chas. H. Otis.*

1290. Anonymous. **Die Sozialisierung des Forstwesens.** [**The socialization of forestry.**] Oesterreich. Forst.- u. Jagdzeitg. 37: 269–271. 1920.—During the war heavy cutting took place in Austrian forests and conditions are at present unsettled, the peasantry expecting a division and distribution of state forests and large estates. The future of sustained wood production and the very existence of many communities in the mountainous regions depends upon unification of management rather than further subdivision. The public value of the forests demands this. Formation of local voluntary associations of timber land owners, loggers, lumbermen and dealers is recommended, these associations to be united into a greater State association with large powers to govern forest management, lumber prices, export trade, and forest labor.—*F. S. Baker.*

1291. Anonymous. **Wohlfahrtseinrichtungen für Waldarbeiter.** [**Housing conditions for forest laborers.**] Schweiz. Zeitschr. Forstw. 71: 114–116. 1920.—Oberförster Schädelin advocated furnishing quarters in 1908 and Dr. Flury later pointed out that living conditions among the industries were better and more attractive than those of the forest laborers. This resulted in young men seeking other industries rather than the Forest Service.—The author describes the use of portable shelters built for 6 to 12 men that have proved successful in the Canton of Schaffhausen. The contentions in favor of a shelter equipped with a stove are that the men are more contented and willing to work in wet weather because they are able to dry their clothes when they return from work. Also the men do not use so much liquor in order to keep warm.—*J. V. Hofmann.*

1292. Ashe, W. W. **Notes on trees and shrubs in the vicinity of Washington.** Bull. Torrey Bot. Club. 46: 221–226. 1919.—See Bot. Absts. 3, Entry 2963.

1293. Baker, Hugh P., and Edward F. McCarthy. **Fundamental silvicultural measures necessary to insure forest lands remaining reasonably productive after logging.** Jour. Forestry 18: 13–22. 1920.—Silvicultural practice in the Adirondacks has not yet been fully settled and further work is needed in determining the limits of forest types, proper methods of slash disposal, and the requirements of the various species for establishment. A survey of forest lands and forests is needed.—*E. N. Munns.*

1294. Bang, J. P. F. **Lidt om Bjergfyrskovens Behandling.** [**Notes on management of mountain fir.**] Dansk Skovforenings Tidsskr. 4: 189–196. 1919.

1295. Bates, C. G. **A new evaporimeter for use in forest studies.** Monthly Weather Rev. 47: 283–294. *6 fig.* 1919.

1296. Bentley, J. B., Jr. **Municipal forestry in New York.** Amer. Forestry 26: 160–162. *4 fig.* 920. —Describes plantings made in Chenango County, N. Y.—*Chas. H. Otis.*

1297. Biilmann, H. H. **Nogle Tilvaekstoversigter fra Meilgaard Skovdistrikt.** [**Some observations on growth in Meilgaard district.**] Dansk Skovforenings Tidsskr. 5: 30–36. 1920.

1298. Blanford, H. R. **Financial possibilities of even-aged crops in Burma.** Indian Forester 46: 53–61. 1920.—Figures are presented which show possible returns from stands of teak and two other less important woods using 3 and 4.5 per cent as the interest rate. A rotation of around 75 years is forecasted.—*E. N. Munns.*

1299. Boas, J. E. V. **Det Nye Jagtlovsforslag og det Danske Skovbrug.** [**The new game laws and Danish forestry.**] Dansk Skovforenings Tidsskr. 5: 50–55. 1920.

1300. Bohn-Jesperson, J. F. W. **Sitkagranen i Klitten.** [**Sitka spruce in Klitten.**] Dansk Skovforenings Tidsskr. 4: 101–109. *Pl. 8.* 1919.

1301. BOWLES, J. HOOPER. **The California gray squirrel an enemy to the Douglas fir.** Amer. Forestry 26: 26. 1920.—A loss amounting to hundreds of thousands of dollars, caused by girdling of the trees by the squirrel.—*Chas. H. Otis.*

1302. BRIDEL, M. MARC. **Application de la méthode biochemique aux rameaux et aux écores de diverses espèces du genre Populus. [Application of the biochemical method to the branches and barks of various species of the genus Populus.]** Jour. Pharm. et Chim. 19: 429–434. Also *Ibid.* 20: 14–23. 1919.—See Bot. Abstr. 3, Entry 2841.

1303. BROWN, NELSON COURTLANDT. **The royal Italian forestry college.** Jour. Forestry 17: 807–812. 1919.—A brief history of forest education in Italy is given with a description of the school at Vallombrosa. The school has a high scholastic requirement and courses and hours of work do not differ greatly from American practice.—*E. N. Munns.*

1304. BROWN, W. H. **Philippine fiber plants.** Forestry Bur. Philippine Islands Bull. 19: 1–115. *88 pl.* 1919.—A general consideration of Philippine fiber producing plants with descriptions, occurrence, local names, methods of extracting fibers, and the uses to which the fibers are put. About 150 species are considered.—*E. D. Merrill.*

1305. BRUCE, DONALD. **Alinement charts in forest mensuration.** Jour. Forestry 17: 773–801. *16 fig.* 1919.—Alinement charts are adapted for formulae involving three variables. The development and principles underlying these devices with their application in problems of mensuration in determining the volume of trees is given in detail with illustrations as to their practical use. Advantages of much quicker computation and ease of construction are claimed over the use of slide rules and sets of curves employed in the past.—*E. N. Munns.*

1306. BUTLER, OVID M. **Relation of research in forest products to forest administration.** Jour. Forestry 18: 275–283. 1920.—Silviculture cannot overlook the technical quality of the wood in its forest practice as the latter is influenced by silvicultural practices. Growth influences the technical properties of the wood greatly in seasoning, in strength and in use. Mechanical and physical qualities have already shown a close relation to rate and character of growth, and chemical uses may do likewise.—*E. N. Munns.*

1307. CABRERA, TEODORO. **La utilidad de los guayabos. [Uses of the guava trees.]** Revist. Agric. Com. y Trab. 2: 628. 1919.

1308. CARTER, H. **Report on forest administration in Burma, for year ended June 30, 1918.** *114 p., 1 pl.* Rangoon, British India, 1919.—At the close of the year the aggregate area of the reserved forests was 29,116 square miles, about one-fifth of the total forest area of the province, and in addition there are large tracts proposed for reservation. The area under approved working plans is 10,832 square miles, or 37 per cent of the total reserved area. A system of cultivation called *taungya* (shifting cultivation, i.e., an area cleared and burned in hilly country for shifting cultivation) is practiced on areas aggregating 1,230 square miles of reserved forests by the wild hill tribes, comparatively low in the scale of civilization. When uncontrolled this system causes greater and more permanent damage than a fire. These wild tribes will not undertake permanent cultivation and are averse to settling in the plains. The problem is difficult but it is expected to regulate the *taungyas* by rotation in connection with the control of forest villages and also obviate local shortages of forest labor. By this plan the jungle tribes could be provided with all the virgin soil they require and the abandoned *taungyas* be stocked with a valuable forest crop. In a search for sites suitable for the extension of cinchona the following is reported of the damage by the *taungya* system: "Land with the necessary soil conditions has been very much to seek. Areas, some of which half a century or more ago would probably have afforded the requisite conditions, have been ruined by the practice of the jungle tribes of the pernicious system of shifting cultivation known in South India as *kumri*, in Burma as *taungya* and in Assam as *jhum*, by which enormous stretches of magnificent forest have been destroyed and the surface soil exhausted and more or less

washed away by the unimpeded rush of rain water." And of an area west of the Upper Chindwin: "As regards cinchona prospects, the journey was disappointing. There was no need to go inland from the river for all along the outer ranges the ravages of shifting cultivation were only too evident. The evergreen forests are being rapidly destroyed." During the year 1,814 acres of *taungya* plantation were newly formed. Detailed tabulated data (72 pp.) is appended. In reviewing the year's work it is stated that the future before the Forest Department is one of the greatest activity; for not only has the better exploitation of the commercial forests to be undertaken, but the proper conservation of all that unclassed forest on which the agricultural demand is now concentrated can not be left in its present neglected condition. Such vast areas as the unclassed forests of Burma (74,707,834 acres) can not long be subjected to such profligate destruction as is now going on in many places for want of control and of staff to exercise it. *The conservation of these forests is not a matter of mere revenue*, but in the best interests of the whole population and most especially to the advantage of the agricultural classes.—*E. R. Hodson.*

1309. Cary, A. **Ticks and timber.** Amer. Forestry 26: 92–94. *5 fig.* 1920.—Concerns forest conditions in the Gulf states, U. S. A.—*Chas. H. Otis.*

1310. Chandler, B. A. **Financial loss to the community due to forest lands becoming wastes.** Jour. Forestry 18: 31–33. 1920.—Destructive lumbering is responsible not alone for the economic and financial loss due to the wasteful cutting and burning, but also for the degeneration of the people through loss of the vigorous stock, poor crops, whiskey and malnutrition. Such people need assistance from the outside and larger communities, as they are not self sustaining. In such regions, a peculiar type of degeneracy is developing.—*E. N. Munns.*

1311. Churchill, Howard L. **Approximate cost of private forestry measures in the Adirondacks.** Jour. Forestry 18: 26–30. 1920.—Cost of a forester and proper forest work in a lumber company was found to amount to an annual charge of 36 cents per thousand feet, while the charges due to conservative lumbering amount to 65 cents per thousand.—A comment by W. N. Sparhawk is to the effect that a number of items are not properly forestry but lumbering, thereby reducing the cost considerably.—*E. N. Munns.*

1312. Curtiss, C. F. **Forest parks and their relation to the rural community.** Rept. Iowa State Hortic. Soc. 53: 363–364. 1918.—See Bot. Absts. 3, Entry 3038.

1313. D'Aboville, P. **Detérmination du diamètre au milieu du tronc de l'arbre sur pied.** [**Determination of the middle diameter of a standing tree.**] Translated by S. T. Dana. Jour. Forestry 17: 802–806. *1 fig.* 1919.—By means of similar triangles based on known distances from the tree and the relation between the diameter of the tree at breast height and the intercepted diameter on a scale held at arms length, the diameter at half the height can be obtained. A formula is given for the practical application of this principle to field use.—*E. N. Munns.*

1314. Dalgas, J. M. **Døende Egeskov i Westfalen.** [**The dying oak forest: Westfalen.**] Dansk Skovforenings Tidsskr. 4: 64–72. 1919.

1315. Dalgas, J. M. **Gavntraeproduktionens Samfundsøkonomiske Betydning.** [**The economic importance of production of lumber.**] Dansk Skovforenings Tidsskr. 4: 446–453. 1919.

1316. Dalgas, J. M. **Nogle Oplysninger om Skove og Skovforhold i Nordslesvig.** [**Forest conditions in North Schleswig.**] Dansk Skovforenings Tidsskr. 4: 160–189. *1 fig.* 1919.

1317. Davis, R. N. **The winter aspect of trees.** Amer. Forestry 26: 87–91. *10 fig.* 1920.

1318. DICKIE, F. **Discovery of sugar on Douglas fir.** Amer. Forestry 26: 84–86. *1 fig.* 1920.—The Indians of British Columbia knew of the existence of sugar on the Douglas fir long before the first white man came to North America. Only now the facts have been ascertained. Reporting upon the findings of PROF. DAVIDSON and MR. TEIT, the writer states that "fir sugar" is occasionally formed during summer droughts or in dry-belt regions, sugar-bearing trees being most abundant between the 50th and 51st parallels and between 121°-122° longitude. The "manna" is a natural exudation from the tips of the needles, occurring as white masses ranging from ½ inch to 2 inches in diameter on leaves and branches. A light rain may quickly dissolve the sugar and it may be found recrystallized in patches at the base of the tree. At other times it remains in a semifluid condition. The sugar contains nearly 50 per cent of the rare trisaccharide, melezitose. Sugar-producing firs are chiefly those standing on gentle slopes facing east and north in comparatively open areas. In these situations, the leaves being exposed to the sun, an abundance of carbohydrates more than normal are formed during the day, which are not stored or carried to the growing tissues, as is the case with Douglas fir in heavily forested areas. The ground and atmosphere being dry, an increased root pressure and cessation of transpiration cause the leaves to become water-gorged. This water contains a sugar created by the reconversion of starch into sugar. By evaporation, the sugar is deposited on the leaf tips. By reason of the necessity for a succession of sunshiny days to produce the sugar, the Douglas fir does not yield a harvest that can annually be depended upon.—*Chas. H. Otis.*

1319. DICKIE, F. **Sugar from the Douglas fir.** Sci. Amer. 122: 165, 174-175. *1 fig.* 1920. —The sugar-yielding firs are confined to the dry belt of British Columbia, and are chiefly found in the hottest parts of the interior of the province between parallels 50° and 51° and 121°–122° longitude. Trees standing on gentle slopes facing north and east and which are fairly wide spaced produce sugar in greatest abundance. The sugar occurs in white masses scattered over the foliage and branchlets, the accumulation of drops; drops of small size may appear upon the leaves at the tips and sometimes two or three tips will become imbedded in a very large drop. Analysis shows that the sugar yields about 50 per cent of the rare trisaccharide, known as melezitose. The Indians of the region have known of this occurrence of sugar on the Douglas fir for a long time and gathered it whenever available; but it is an uncertain crop, owing to reasons of climate.—*Chas. H. Otis.*

1320. DROLET, GEORGE. **Turpentine orcharding effect on longleaf timber.** Jour. Forestry 17: 832–834. 1919.—Turpentining with only slight damage to virgin longleaf timber has been successful in Alabama under a system where the crops are worked for only 2 years and then logged. Only healthy trees over 12 inches are tapped and not more than two cups are placed on a tree. Results of 4 years' work are given which show that there is a loss from turpentine operations which may be kept small, and that this loss increases with the length of the operation.—*E. N. Munns.*

1321. DUNBAR, JOHN. **Forty-two distinct forms of hickories.** [Rev. of: SARGENT, C. S. **Notes on North American trees—II. Carya.** Bot. Gaz. 66: 229–258. 1918.] Amer. Nut. Jour. 10: 20–21. *1 fig.* 1919.

1322. ELDREDGE, I. F. **Management of hardwood forests in the southern Appalachians.** Jour. Forestry 18: 284–291. 1920.—An outline is given of a management plan for use in the hardwoods. The problem presented is one of area regulation with 6 age-classes to be considered in arriving at the volume of cut in any period in the working circle.—*E. N. Munns.*

1323. EYSSELT, JOH. "Weidwald." [Pasturewood.] Oesterreich. Forst.- u. Jagdzeitg. 38: 1-2. 1920.—The present high value of grazing lands is leading to a demand for the extension of "pasture-woods" particularly in the alpine forests. This is considered contrary to public policy, however, as it would entail injury to exceedingly valuable protection forests, and lead to the extension of mountain torrents, avalanches and landslides, while experience as shown that the removal of the timber has also led to a deterioration of the pasturage

as well. The segregation of all pasture-woods that have protection value is urged, to be managed on a strictly protective basis. Artificial extension should be practiced at least to the formation of clumps of trees, such as are naturally found in alpine meadow situations.—*F. S. Baker.*

1324. Fabricius, O. **Rødgran paa Fyn.** [Red spruce at Fyn.] Dansk. Skovforenings Tidsskr. 4: 317-372. 1919.

1325. Fernow, B. E. [Rev. of: Recknagel, A. B., and John Bently, Jr. **Forest management.**] Jour. Forestry 17: 850-853. 1919.—See also Bot. Absts. 5, Entry 1373.

1326. Feucht, Otto. **Zur Entstehung des Harfenwuchses der Nadelhölzer.** [On the formation of "harp-growth" on conifers.] Naturw. Zeitschr. Forst- u. Landw. 17: 137-139. *1 fig.* 1919.—S. Klein, and other authors, agree that the secondary stems, producing the so-called "harp" formation, are developed from the existing primary branches. The author, in the summer of 1917, discovered a white pine in the community of Würzbach (Wurtt, Black Forest), which exhibited a new sort of origin. On this tree, not a single branch has attempted to form a secondary stem, but some twenty young stems have arisen on the back of the tree below the upper third, evidently from dormant buds, either from the old whorls or between them.—*J. Roeser.*

1327. Flint, Howard R. **A suggested departure in national forest stumpage appraisals.** Jour. Forestry 17: 823-831. 1919.—Present methods of stumpage appraisals on the national forests are deemed unsatisfactory and the proposal is made to change these by basing the price to be paid on the total receipts at stated intervals from lumber sales and costs of operation expressed in work hours of men, horses or machines.—*E. N. Munns.*

1328. Girard, James W., and U. S. Swartz. **A volume table for hewed railroad ties.** Jour. Forestry 17: 839-842. *1 fig.* 1919.—To overcome the recent change from two classes to five for railroad ties a volume table was prepared for Douglas fir and larch based on the diameter and number of ties per tree. The difference in form factors between the two species is not sufficient to affect the grades or number of ties.—*E. N. Munns.*

1329. Graves, H. S. **The extension of forestry practice.** Amer. Forestry 26: 50,51. 1920.

1330. Graves, Henry S. **A policy of forestry for the nation.** Jour. Forestry 17: 901-910. 1919.—Present handling of forests in U. S. A. is not satisfactory and public interest requires public ownership of extensive areas and public participation in protection and management. A national policy demands action by the government, the states and by private owners of forest lands. National forest land should be increased, states should acquire and extend their holdings to assist in their economic and industrial life, and municipalities should have forest land to protect the water supply and to serve as a source of revenue.—On private lands, state and national aid should be given to prevent fires and legislation to this end should be undertaken by the states. Similar action by the states is necessary to require the forest owner to prevent lands becoming waste after lumbering and to assist the forest owner to secure the maximum production. In this, the states should be aided by the National government. Uniform taxation and a forest loan act are necessary, and a federal law is required to provide the government with authority to extend its influence and assistance to the states.—*E. N. Munns.*

1331. Greeley, W. B. **The forest policy of France. The control of sand dunes and mountain torrents.** Amer. Forestry 26: 3-9. *7 fig.* 1920.—Material for this article has been taken largely from "*Cours de Droit Forestier,*" by Charles Gugot, and from data prepared by G. Garbe, Engineer des Ponts et Chausses. Bremontier is credited with having developed the methods which were successful in halting the destructive course of the Gascon dunes. These embraced the construction of a rampart along the coast, planting hardy herbs on the dunes within the rampart and planting seeds or seedlings of maritime pine. A

national policy was adopted in 1810, and by 1864 the forestation of the 250,000 acres of dunes bordering the Landes was practically completed. Since that date the work has consisted largely in the care of the plantations established, the construction of new ramparts along the coast where dangerous dunes were forming, the extension of the successive zones of vegetation up to the limits of security thus established and the administration of the maritime pine forests which have been created. The successful reforestation of the dunes gave great impetus to the planting of maritime pine throughout the entire Landes. Today the Landes are a vast pinery, interspersed with little meadows and neat farms and traversed by a network of surfaced highways.—In the control of torrential erosion in the Alps and Pyrenees, France has been confronted with a far more difficult problem, which is, essentially, one in social economics. Following terrible floods in 1859, a reforestation law was passed in 1860, and by 1882 reforestation projects in the mountains had reached a total of some 350,000 acres. New laws passed at this time provided for more reduced areas for planting and other intensive methods, being limited to the immediate channels or slopes where erosion was taking place, and the establishment of large protection belts in the mountains, surrounding the limited water courses in which serious erosion was actually taking place. Further, the grazing of certain communal pasture lands was placed under public control. Human obstacles have prevented the perfect working of these measures. In controlling erosion, the line of attack is to reduce the trickling action of water on slopes, prevent the starting of gullies and hold loose soil or rock in place. This is accomplished by tree planting and by the employment of dams.—*Chas. H. Otis.*

1332. GREELEY, W. B. **Private forestry in France.** Amer. Forestry 26: 139-143. *2 fig.* 1920.

1333. GREELEY, W. B. **Self-government in forestry.** Jour. Forestry 18: 103-105. 1920.—Comment on national forest policy.—*E. N. Munns.*

1334. GRIFFIN, GERTRUDE J. **Bordered pits in Douglas fir: a study of the position of the torus in mountain and lowland specimens in relation to creosote penetration.** Jour. Forestry 17: 813-822. *1 fig.* 1919.—Examination of the pits in Douglas fir showed a tendency in the torus of the mountain wood to aspirate (close) the pit while the opposite was true of the lowland woods, oven drying increasing the aspirated tori in both mountain and lowland varieties. In both sapwood and heartwood of the mountain variety, a large proportion of aspirated tori were found in air-dried wood, while only in the spring wood of the heartwood were the tori aspirated. Penetration of creosote was found to coincide directly with the number of aspirated tori. Subsequent treatments of air-dried material failed to open the tori when once aspirated, though soaking in alcohol before drying prevented their closing.—*E. N. Munns.*

1335. GUJER, A. **Zu unserer Titulaturfrage.** [The question of titles.] Schweiz. Zeitschr. Forstw. 71: 78-81. 1920.—The present titles are objectionable because they do not express the grade of the position and do not differentiate between the practical and technical positions.—It is proposed to replace "Förster" and "Oberförster" by "Förster" and "Förstmeister." "Förster" should apply to practical positions and "Förstmeister" to technical positions. The title could be used to cover all positions such as Kreis-, Bezirks-, Stadt-, Gemeinde- or Korporationsförstmeister. Such titles would eliminate the general usage of "Förster" for all employees in the profession of forestry.—*J. V. Hofmann.*

1336. GUTHRIE, JOHN D. **Women as forest guards.** Jour. Forestry 18: 151-153. 1920.

1337. HALL, S. J. **Trees that are older than history.** Sci. Amer. 122: 303. *2 fig.* 1920.—Concerns the Sequoia.—*Chas. H. Otis.*

1338. HARVEY, LEROY H. **A coniferous sand dune in Cape Breton Island [Nova Scotia].** Bot. Gaz. 51: 417-426. *8 fig.* May, 1919.—See Bot. Absts. 4, Entry 288.

1339. Haugh, L. A. **Klimaets Indflydelse Paa Udviklingen af Bøgens Sommerskud. [The influence of climate on the development of summer growth of beech.]** Dansk Skovforenings Tidsskr. 4: 13-28. *Fig. 4.* 1919.

1340. Hawes, A. F. **Raw material for the paper industry.** Amer. Forestry 26: 134-138. *6 fig.* 1920. The present paper shortage, U.S.A., is probably the result of the unusual amount of advertising carried by the newspapers, rather than of any scarcity of wood. The better grades of paper are still made from rags. While paper can be made from various plant fibers, straws and certain other materials, the collection of these materials in bulk is so costly that none of them can compete with wood. Spruce, hemlock and fir are the three main woods used in paper making. 95 per cent of the pulp and paper mills in the United States are located in the East, and the present supplies of these woods cannot be expected to last more than 25 years. Up to 1909 the country was self-supporting in respect to pulpwood, but since that date the consumption has exceeded the home product. Importations from Canada are constantly increasing. There are ample supplies of pulpwood for a great many years in Alaska and the Northwest. These may for several reasons become available.—*Chas. H. Otis.*

1341. Hawley, R. C. **Forestry in southern New England.** Amer. Forestry 26: 10-15. *7 fig.* 1920.—The territory embraced is roughly the states of Connecticut and Rhode Island. The region is primarily a manufacturing district. The forest area is now about 46 per cent of the total land surface. This forested area may be considered better suited for growing trees than for the production of agricultural crops. The forest is primarily hardwood in character. An upland hardwood type comprises over 80 per cent of the forest area, a swamp hardwood type less than 7 per cent, a pine (usually white) type about 2 per cent, an old field type (pine) 9 per cent and a hemlock type forms about 2 per cent of the area. As a whole the forests of southern New England are of second growth.—*Chas. H. Otis.*

1342. Hay, R. Dalrymple. **Third annual report of the forestry commission, New South Wales, financial year ended June 30, 1919.** *58 p., 1 diagram, 8 pl.* Sydney, 1920.—The Forestry Act, passed by Parliament, November, 1916, created the Commission with powers to place the management of the forests on a business footing. Included in this plan is the systematic working of the forests with a view to regeneration and growth of future crops, and the disposal of timber and other forest produce to the best advantage. The Commission is exercising its powers with discretion and judgment in getting the new regime gradually under way, but is meeting with considerable opposition from the adherents of the old system of forest working, which was largely at the will of the operator. The forest area of New South Wales is estimated to be 11,000,000 acres, of which 5,043,800 acres have been proclaimed State forests and 566,730.5 acres are under working plans. It is stated that the available area of timber-bearing land of commercial value in the entire Commonwealth, previously estimated at 97,400,000 acres, can be reduced (on the basis of the past year's data) with certainty to about 24,500,000 acres. Of this area only about 18,000,000 acres had so far been protected from alienation in the interest of forestry. The estimated proportions in each State of the foregoing total (24,500,000 acres) are: New South Wales, 8,000,000 acres; Victoria, 5,500,000 acres; Queensland, 6,000,000 acres; Western Australia, 3,000,000 acres; Tasmania, 1,500,000 acres; and South Australia, 500,000 acres. At the instance of the Premier of New South Wales, the importance of ultimately appropriating a National forest area of about 30,000,000 acres for the whole Commonwealth, is being urged for the Commonwealth and the States' consideration. This area should comprise about 25,000,000 acres of indigenous forest country, and about 5,000,000 acres of coniferous plantation. During the year 98,372 acres of State forest area were released for settlement, 407½ acres were planted to conifers, chiefly *Pinus insignis* and *P. pinaster*, and 23,707.5 acres were treated for natural regeneration and silvicultural improvement. A number of trees and fiber plants were tested for pulping material; the trees were mountain gum (*Eucalyptus goniocalyx*), coral tree (*Erythrina*), and mountain ash (*Eucalyptus sieberiana*). The algaroba bean (*Prosopis juliflora*) is being tested in a number of localities for fodder purposes. The outer sheathing of the gray ironbark (*E. paniculata*) has

proven an excellent substitute for cork and cork waste, which is used largely in the manufacture of insulating material. Experiments undertaken to ascertain whether this sheathing could be removed without injury to the growing tree have resulted successfully. Mountain ash (*E. gigantea*) is being tested for veneer material. Many other investigations on a variety of subjects are also under way. Mistletoe is doing serious damage to the forests of the western districts. The following species are infested: *Acacia anceura*, *Eremophilla longifolia*, *E. creba*, *E. dealbata*, *E. rostrata*, and *C. luehmanni*. An area of 37,500 acres of Crown land in the vicinity of Buckenboura, on the South Coast was recently temporarily withdrawn from settlement for the growing of wattle trees for tanbark production. The principal species of wattle of tannic value (*Acacia decurrens*) is widely distributed on the area and appears well adapted to local climatic and soil conditions. It is expected therefore to set aside the better portions of the area as a National permanent reserve for the growth and preservation of wattle. Reference is made to an article by A. SHALLARD published in the October, 1918, issue of the *Australian Forestry Journal* which states that probably 20,000 people in Australia keep bees, and that the yield last season was between 5000 and 6000 tons of honey, the bulk of which came from the gum (eucalypt) trees, and among the principal varieties of honey value, the ironbarks, the stringybarks, the boxes, flooded gum, white mahogany, tallow wood, spotted gum, gray gum, and bloodwood, are given first place. In order to widen the use and productiveness of the state forests in this direction, the Commission has now made arrangements for the issuance of bee-farming permits, which convey to the holders certain privileges of occupation and use, and enable liberal areas of the state forests to be taken up as bee ranges.—*E. R. Hodson.*

1343. HELMS, JOHS. **Weymouthsfyrren paa Silkeborg Skovdistrikt. [Pinus monticola at Silkeborg District.]** Dansk Skovforenings Tidsskr. 4: 402-408. *Pl. 2.* 1919.

1344. HENKEL, J. S. **Afforestation in Zululand.** Rhodesia Agric. Jour. 17: 50-52. 1920.—Judging by the indigenous vegetation and the bad effects of strong winds, conditions at Empangeni appeared far from favorable for the growing of exotic timber trees. Quite a large number, however, have adapted themselves to the conditions, the outstanding successes being secured with eucalypts.—*E. M. Doidge.*

1345. HESSELMAN, HENRIK. **Iakttagelser över Skogsträdspollens Spridningsförmåga. [Dissemination of pollen from forest trees.]** Meddel. Statens Skogsförsöksanst. 16: 27-60. *8 fig.* 1919.—See Bot. Absts. 4, Entry 232.

1346. HODAL. **Fransk bergfuru (Pinus montana gallica). [French mountain pine.]** Tidsskr. Skogbruk 28: 1-12. *Pl. 2.* 1920.

1347. HOLE, R. S. **A new species of Ixora.** Indian Forester 45: 15-16. 1919.—See Bot. Absts. 3, Entry 2983.

1348. HOLTEN, JUST. **Gamle Ege i Christianssaedes Skove. [Old oaks on Christian Manor.]** Dansk Skovforenings Tidsskr. 4: 379-395. 1919.

1349. HOSMER, RALPH S. **One aspect of the national program of forestry: cost.** Jour. Forestry 18: 9-12. 1920.—The cost item has been left out of consideration in the discussion of a national forest policy. This is important because the antagonism of private owners is apt to result if the burden falls too heavily on them, and if the burden on the population is too heavy, there is apt to be trouble from the other side. In any case, the public pays the bills in the end.—*E. N. Munns.*

1350. HOSMER, R. S. [Rev. of: JUDD, C. S. **Report of the Division of Forestry, Territory of Hawaii, for biennial period ended Dec. 31, 1918.**] Jour. Forestry 17: 853-855. 1919.

1351. HUBAULT, E. **Efter krigen paa de britiske øer. [The British Islands after the war.]** [From Rev. Eaux et Forêts. Oct., 1919.] Tidsskr. Skogbruk 27: 276-291. 1919.

1352. Jessen, P. P. **En Ny Dansk Impraegneringsmetode. [A new Danish staining method called Teakin.]** Dansk Skovforenings Tidsskr. 4: 427–445. *Pl. 8.* 1919.—The process consists in pressing different kinds of liquids which contain coloring matter into the wood. These are either inorganic salts or aniline dyes. The color is taken up by the cells of the wood.—*J. A. Larsen.*

1353. Judd, C. S. **An historical mesquite tree.** Sci. Amer. 122: 165, 175. *1 fig.* 1920.—Descriptive of the algaroba (*Prosopis juliflora*), its occurrence in Hawaii, characteristics, uses and propagation.—*Chas. H. Otis.*

1354. Kellogg, R. S. **The news print paper situation.** Amer. Forestry 26: 147. 1920.

1355. King, H. E. **Tree planting in community, a suggested scheme.** South African Jour. Indust. 3: 161–163. 1920.

1356. Kinzel, Wilhelm. **Ueber eine neue Methode des Durchfrierens und die damit erzielten Erfolge bei zahlreichen bisher nicht oder kaum zur Keimung gebrachten Samen. [Concerning a new method of freezing and the results derived with numerous unfertile seed or seed with very low germinative power.]** Naturw. Zeitschr. Forst- u. Landw. 17: 139–142. 1919.—The author discusses the varying results obtained in the artificial treatment of seed either in light at 20° or in the dark under frost conditions. He cites a considerable number of examples. However, it is evident, that some species show little response to the methods hitherto employed. Treatment of seed by frost in conjunction with light has in the past been avoided, because where used, harmful results were obtained. This method, though, is very successful in many cases, and will yet become important in the case of many tree seeds. It cannot be used with seeds rich in chlorophyl, such as Acer and Fraxinus, or with frost sensitive seed, such as beech, hazel-nut, yew and others.—*J. Roeser.*

1357. Kirkland, Burt P. **Co-operation between national forests and adjacent private lands.** Jour. Forestry 18: 120–130. 1920.—To insure continuous forest production and the permanence of wood using industries, the owners of lands in units totaling more than 25,000 acres should consider the area as a whole. This would permit of better equipment and personnel, a permanent town-site and the development of practical forestry. Protection is to be paid for on an ownership basis, and the area to be restocked as cut by nature or planting. Careful cutting and trained supervision to follow the entire operation.—*E. N. Munns.*

1358. Kirkland, Burt P. **Economics of private forestry.** Jour. Forestry 18: 214–217. 1920.—The misconceptions of those who believe forestry uneconomic are due to misbeliefs in the rights of private property, interest returns and capitalisation and taxation.—*E. N. Munns.*

1359. Kitchin, P. C. **Preliminary report on chemical weed control in coniferous nurseries.** Jour. Forestry 18: 157–159. 1920.—Applications of copper sulphate, zinc chloride, and sulphuric acid to seed beds gave greatly reduced numbers of weeds, especially good were the results from the first two salts. Further work is in progress.—*E. N. Munns.*

1360. Knuchel, Hermann von. **Zur Praktikantenfrage. [The probation question.]** Schweiz. Zeitschr. Forstw. 71: 69–78. 1920.—A plea for better conditions for the probationer and more democratic relations between academic and applied forestry. The probationer should receive pay and should be allowed to serve under practical foresters on applied forest problems rather than the general system of working as a subordinate, without pay, under an instructor.—The state should encourage students to attend forest schools, but should not subsidize them. Enrollment at the forest schools should be limited to the number of men needed by the state. Foresters must receive better pay and be placed on social equality with other professions such as medicine, etc.—*J. V. Hofmann.*

1361. Koehler, Arthur. **Identification of mahogany.** [Review of several papers.] Jour. Forestry 18: 154–156. 1920.

1362. KORNERUP A., AND H. MUNDT. **Aske-Gavnetra.** [Ash for lumber.] Dansk Skovforenings Tidsskr. 5: 1-29. *18 fig.* 1920.

1363. KÜHL. **Traeets Kemiske Leknologi.** [The chemical composition of wood.] Dansk Skovforenings Tidsskr. 4: 28-64, 110-146. *45 fig.* 1919.

1364. LEE, LAURENCE. **Notes on the Parana pine of southern Brazil.** Jour. Forestry 18: 57-61. 1920.—The Parana pine has a stand of about 650 billion board-feet in Brazil. The wood is said to be superior to Swedish pine and even the southern longleaf pine of North America. There are no resin ducts and resin accumulates only at the base of knots. At the present time the lack of shipping facilities and the unfair taxes are keeping this timber from the market.—*E. N. Munns.*

1365. LEOPOLD, ALDO. **Determining the kill factor for blacktail deer in the southwest.** Jour. Forestry 18: 131-134. 1920.—A method similar to that used in estimating cattle is proposed for obtaining data on the blacktail deer.—*E. N. Munns.*

1366. MADDOX, R. S. **Reclamation work a vital forestry problem.** Amer. Forestry 26: 74-76. *5 fig.* 1920.—Relates particularly to conditions in Tennessee.—*Chas. H. Otis.*

1367. MAIDEN, J. H. **A critical revision of the genus Eucalyptus.** Vol. IV, Part 8. P. 201-237, *4 pl.* William Applegate Gullick: Sydney, 1919.—See Bot. Absts. 3, Entry 2995.

1368. MAXWELL, HU. **The uses of wood. Wood in agricultural implements.** Amer. Forestry 26: 148-155. *14 fig.* 1920.

1369. MCLEAN, R. C. **Studies in the ecology of tropical-rain forest: with special reference to the forests of South Brazil. I. Humidity.** Jour. Ecology 7: 5-54. *1 pl., 21 fig.* 1919.

1370. MELL, C. D. **The mangroves of tropical America.** Sci. Amer. Supplem. 88: 388-389. *5 fig.* 1919.—The red mangrove (*Rhizophora mangle*) produces the bulk of the commercial bark used for tanning purposes. The bark is from three-fourths to one inch thick, of a dull reddish color, somewhat fibrous and covered with a grayish cork-like cuticle, and contains tannin superior to that of many other barks used for that purpose. The percentage of tannin is from 25 to 36. The gathering of the bark is a difficult task.—*Chas. H. Otis.*

1371. METCALF, C. D. **Logging with belt tread tractors.** Sci. Amer. Monthly 1: 42-44. *5 fig.* 1920. [Reprinted from the *West Coast Lumberman.*]

1372. MINCHIN, A. F. **Annual rings in sal.** Indian Forester 46: 38-45. *9 fig.* 1920.—Annual rings in sal may be distinguished on a tangential cut when not possible on a radius. Fresh cut stumps only can be used and a clean smooth surface is essential. Stump counts and measurements of trees of known age show a very close relationship though based on a very small number of trees.—*E. N. Munns.*

1373. MOORE, BARRINGTON. [Rev. of: RECKNAGEL, A. B., AND J. BENTLEY, JR. **Forest management.** *xiii + 269 p., 26 figs.* John Wiley & Sons: New York, 1919. Net $2.50.] Torreya 20: 34-35. 1920.—The book is written for owners of forest-lands who are not professional foresters. Four branches of forest management are treated: (1) mensuration; (2) regulation of cut; (3) finance; (4) administration. Both the forest-owner and professional forester will find the book valuable. [See also Bot. Absts. 5, Entry 1325.]—*J. C. Nelson.*

1374. MULLOY, G. A., AND W. M. ROBERTSON. **An analysis of logging costs in Ontario.** Jour. Forestry 17: 835-838. 1919.—Data on logging costs compiled from a large number of reports on operations in Ontario through several years is given for 11 divisions of cost covering 82 detailed items.—*E. N. Munns.*

1375. Munns, E. N. **Effect of fertilization on the seed of Jeffrey pine.** Plant World 22: 138–144. 1919.—Various crosses between thrifty, mistletoe-infested, insect-infested, and suppressed specimens of *Pinus jeffreyi* were made, with the result that thrifty trees produce larger and heavier seeds, with a higher germination percentage, higher rate of germination, higher real value per pound, and ability to produce stronger seedlings. Seeds borne on suppressed, malformed, and diseased trees are of inferior quality for planting. The author suggests forest management in which diseased and suppressed trees are removed, and only thrifty seed trees left for seed purposes. In collecting seed for forest tree nurseries, thrifty trees should be chosen as parents. [See also Bot. Absts. 5, Entry 1589.]—*Chas. A. Shull.*

1376. Nellemann, L. P. **Nogle Undersøgelser Over Arbejdstid og Arbejdsydelse.** [Some investigations on working hours and working men's aid.] Dansk Skovforenings Tidsskr. 4: 408–427. 1919.

1377. [Nordstedt, C. T. O.] [Swedish rev. of: Ostenfeld, C. H. **Bemerkninger om danske Træer og Buskes Systematik og Udbredelse I. Vore Ælme-Arter. (Remarks on the systematics and distribution of Danish trees and shrubs. I. Our species of Elms.)** Dansk Skovforenings Tidsskr. 1918: 421–442. 1918.] Bot. Notiser 1919: 102. 1919.

1378. Oppermann, A. **Et Lovbuds Udviklingshistorie.** [History of the development of a law.] Dansk Skovforenings Tidsskr. 4: 146–160. 1919.

1379. Oppermann, A. **Vort Skovbrug Omkring Aar 1900.** [Our forestry in 1900.] Dansk Skovforenings Tidsskr. 4: 259–316. 1919.

1380. Pammel, L. H., and C. M. King. **The germination of some trees and shrubs and their juvenile forms.** Proc. Iowa Acad. Sci. 25: 292–340. *Fig. 45–120.* 1920.—One lot of seeds was placed in good greenhouse soil in the fall (1917) and stratified in a cold frame, from which they were removed to the greenhouse in March 1918. The second lot was planted in an open place covered with two inches of soil and leaves. Air temperature records were kept throughout the season; soil temperature records were kept in the fall until the ground was frozen, and again during the opening of the growing season of 1918. Tables of temperature and precipitation are given. Photographs or outline drawings of the leaves, and frequently outlines of trichomes, are given, with descriptive text, for the following species: *Juglans cinerea, J. nigra, Carya ovata, C. laciniosa, C. alba, C. glabra, C. cordiformis, Corylus americana, Ostrya virginiana, Betula lutea, B. alba papyrifera, Quercus coccinea, Q. ellipsoidalis, Q. falcata, Q. nigra, Q. imbricaria, Ulmus americana, U. fulva, U. pumila, Celtis occidentalis, Crataegus mollis, C. Crus-galli, Prunus padus, P. serotina, Gleditsia triacanthos, Gymnocladus dioica, Ptelea trifoliata, Acer saccharinum, A. saccharum, A. saccharum nigrum, A. negundo, Aesculus glabra arguta, Vitis vulpina, Tilia americana, Cornus alternifolia, Fraxinus pennsylvanica lanceolata, Catalpa speciosa.* A table gives number of seeds planted and total number germinated.—*H. S. Conard.*

1381. Pammel, L. H., and C. M. King. **A variation in the black walnut.** Proc. Iowa Acad. Sci. 25: 241–248. *Pl. 3, fig. 43–44.* 1920.

1382. Parnell, Ralph. **Progress report on forest administration in the North-West Province for the year 1918–19.** *41 p., 1 map.* Peshawar, British India, 1919.—Incorporated with the annual report is a similar one covering the five-year period from 1914–15 to 1918–19. Since 1917 a beginning has been made in the departmental exploitation of timber. So far walnut, chil, and coniferous timber in one locality have been handled in this way. It is stated that the loss of revenue incurred by the government by leases for even relatively short periods in at all abnormal times, the difficulty of arranging for leases for long periods on a sliding scale of royalties on account of the vested interests involved and the friction inevitable in using the sliding scale, the importance of the Government's retaining its timber in its own hands for as long as possible in case of emergent needs and the public advantage obtained by

the government's being in a position to use the profits of the timber trade for the benefit of the country as a whole instead of these profits going into the pockets of a few long-headed private firms, are believed to justify the abandonment of the system of sales of standing trees and the adoption of the system of departmental exploitation. During the year the department removed by this system 171,000 cubic feet of timber, or 14 per cent of the total timber outturn against 4 per cent the preceding year. Since the walnut supply is becoming exhausted and natural reproduction scarce, it is necessary to plant. A nursery has been established at Nagan and about ¼ acre sown with 21,000 walnuts. It appears the best method of restocking is to sow direct on the areas and fill in the gaps with trees raised in the nursery. Tests of bhan (*Rhus cotinus*) and garunda (*Carrissa spinarum*) leaves have shown a fairly satisfactory tannin content. However, the production from this source would only be sufficient to supplement the small local requirements of the province. Appended are numerous forms summarising detailed tabulated data and a map of the Hazara Division.—*E. R. Hodson.*

1383. PARST, AUGUST. **Die Kienölgewinnung im Wald von Bialowies. [The production of pine-oils in the forest of Bialowies.]** Naturw. Zeitschr. Forst- u. Landw. 17: 105-137. *6 pl., 2 fig.* 1919.—The author briefly reviews the best known volatile oils obtained from conifers, under four headings: (1) those obtained from the bark and wood above ground, (2) through the distillation of needles and buds, etc., (3) through the distillation of cones and fruit, and (4) from the underground woody portion through extraction or dry distillation. The production of pine-oil, a variety of turpentine oil, is an important industry of that section of Europe lying between the Carpathians and the Baltic Sea, including the countries of Poland, Courland and Lithuania. The establishment founded by the writer in 1916 in the Forest of Nowi Most, after it was occupied by the Germans, is then described in considerable detail under the headings: (1) the raw material used in the process of distillation; (2) construction of the establishment including the retort, the heating chamber, the arrangement for carrying off the distillate, the cooling mechanism and the receiver of the pine-oil establishment; and the equipment of the tar and charcoal establishment; (3) the process of distillation; (4) the products resulting from the distillation, chiefly pine-oil, tar and charcoal; (5) cost accounting and profitableness; and (6) conditions necessary to establish the pine-oil industry in Germany. Numerous tables are included to illustrate topics (3), (4), and (5). The author believes that the industry can be successfully introduced, especially in North Germany, both on a small scale and on a large scale if a large supply of woody material can be obtained close at hand, and concludes, that since the Russian producer has made a success of it under very poor economic conditions, there is no ground for believing that success will not crown the efforts of the native contractor surrounded by an economic system organized and developed to the fullest extent. German forest culture is presented with a new prospect for increasing its forest revenue, and at the same time helping to break the economic bands now holding the country.—*J. Roeser.*

1384. PASCHAL, G. W. **A bigger tree.** Sci. Amer. 122: 61. 1920.—A letter concerning a poplar tree with a butt circumference of 39-40 feet.—*Chas. H. Otis.*

1385. PASSLER, JOHANNES. **Das Entrinden von Hölzern unabhängig von der Jahreszeit nach dem Gütschowschen Verfahren. [Bark-peeling independent of the season according to the Gütschow process.]** Schweiz. Zeitschr. Forstw. 71: 116-118. 1920.—It is well known that oaks and other trees do not peel easily except during the spring time when the sap is flowing freely, also the quantity or quality of tannin varies very little during the year. This makes it possible to peel only during a short season although it would be profitable to peel during the entire year. Methods of loosening the bark have been in use for a long time among which the Maitre method in use for the past fifty years is the most commonly used. By this method the wood is steamed at 100°C. before peeling.—A new method devised by GÜTCHOW consists of steaming the wood for several hours at 30 to 40°C. This has the advantage of leaving the wood cooler and easier to handle. It may also be applied in the field by use of a wagon that GÜTCHOW has constructed in which the steaming can be done and the bark dried.—His method applies to the pines also and is the most feasible for field conditions where the cutting is done during the winter season and the wood delivered to the industries later.—*J. V. Hofmann.*

1386. PERKINS, G. W. **Forestry and recreation in the Palisades Interstate Park.** Amer. Forestry 26: 20-26. *8 fig.* 1920.

1387. PERRÉE, W. F. **Progress report of the Forest Research Institute for the year 1918-19.** *22 p.* Calcutta, British India. 1919.—The work of the Institute is organised in five branches: Silviculture, forest botany, forest economy, forest zoology, and forest chemistry. A silvicultural experiment in Thano forest indicates that two regeneration fellings are unnecessary where natural reproduction is already present in sufficient quantity. Sufficient overhead cover to protect from frost is also sufficient to suppress young Sal (*Shorea robusta*). Side protection is of greater value than overhead protection. In this forest the frost risk is slight and therefore it is believed that a clear felling in one operation followed by cleaning and cutting back will prove successful in regeneration. To test this point an experimental area of five acres has been marked for clear felling. Two other plots were laid out in this forest to determine the effect of severe thinning (1) at an early age, and (2) at maturity. The following is indicated in afforestation work at Zaberkhet Tappar: *Dalbergia sissoo* (less damaged by deer) and *Melia azedarach* are the most promising species; rooted cuttings of *Dalbergia sissoo*, *Bombax malabaricum*, *Eugenia jambolana*, and *Grewia vestita* have been successful, while *Terminalia tomentosa*, *Ougenia dalbergioides*, and *Mallotus philippinensis* have given fair results, and that Chir (*Pinus longifolia*) can be better raised from direct sowings than by transplanting. (July is best season for transplanting this species.) In the study of tan-yielding trees and shrubs *Anogeissus latifolia* is being tested to determine the best season for pollarding, *Cassia auriculata* for stimulation of germination and for methods of transplanting. *Phyllanthus emblica* was found frost hardy, and both direct sowings and transplants from nursery have proved successful; germination ranged from 70 to 90 per cent. *Elaeodendron glaucum*, also frost hardy, showed 70 per cent germination and both direct sowings and transplanting proved successful. In the branch of Forest Botany the problem of regenerating the Sal is believed solved by a series of recent investigations. The factors injurious to the establishment of the seedling, due to the interaction of a soil-covering of dead leaves, drought, and bad soil aeration, are eliminated more effectively by a complete removal of the overhead canopy than by either burning the soil covering, or by removal of undergrowth, with or without partial thinning of the overhead cover. Owing to the uncertainty of good seed years and for other reasons, the restocking of the area by artificial sowings is preferable to reliance on natural regeneration. It has further been proved that much better results are obtained from broadcast sowings in cleared patches and narrow strips with full overhead light than from sowings under the shade of a partial canopy. Therefore the system proposed for handling Sal is a combination of the group and strip methods, in which the size of the unit regeneration areas is determined by the average height of the forest at maturity, and their sequence and orientation by local requirements for shade. A number of woods have been investigated for industrial use. The branch of Forest Chemistry obtained from the leaves of *Cinnamomum glanduliferum* 0.20 per cent of camphor and 0.44 per cent of camphor oil. From the leaves of *Eucalyptus tereticornis* and *E. crebra* collected at Kaunli, Dehra Dun, were obtained oils which resembled those of similar species grown in Australia. The former contained a small percentage of eucalyptol but the oil from neither of these two species of eucalypts complies with the standard of the British Pharmacopoeia. *Artemisia maritima* was examined for santonin with negative results. The phenolic portion of the light Chir (*Pinus longifolia*) tar oil, a by-product in distilling this species for Stockholm tar, showed 8 per cent of guaiacol and 42 per cent of creosole. Kelp (*Saragosum species*) from the Bombay Coast contained 0.02 per cent of iodine and 1.14 per cent of potassium. The Institute library has increased its books and periodicals to 14,014. Appended is a list of the current year's publications and also a cumulative list from the beginning of the Institute. In general it is expected to develop the Research Institute, to serve not only the scientific and economic interests of the Forest Department, but also to function as the central bureau of information for the entire Indian scientific and commercial community.—*E. R. Hodson.*

1388. PETTIS, C. R. **Legislative machinery for enforcement of private forestry measures.** Jour. Forestry 18: 6–8. 1920.—An attempt should be made to make lumbering operations and cut over lands more safe from fire. This may be done in New York by leaving strips and bands of uncut timber along roadways and creeks to create fire breaks, by the construction of fire lines, by burning the slash. Demonstration forests and foresters are needed to show what can be accomplished.—*E. N. Munns.*

1389. PINCHOT, GIFFORD. **National or state control of forest devastation.** Jour. Forestry 18: 106–109. 1920.—State control does not offer the surest and strongest control of forest devastation; national control does and has proved its point in the past.—*E. N. Munns.*

1390. POOL, RAYMOND J. **The fuel situation in Nebraska and the need for greater wood production.** Publ. Nebraska Acad. Sci. 10: 17–28. 1920.—The author discusses the need of wood, the shortage of wood, and the value of woodlots in Nebraska. He urges thinning of groves and wind-breaks, and cutting off when the crop is mature.—*H. S. Conard.*

1391. POTTS, H. W. **The honey locust tree.** Agric. Gaz. New South Wales 31: 85–90. 7 *fig.* 1920. Gives chemical analysis of seeds.—*L. R. Waldron.*

1392. [PRATT, GEO. D.] **New York's forestry program.** Amer. Forestry 26: 51–52. 1920.

1393. RAFN, JOHANNES. **Skovfrøanalyser i Saesonen 1917–18.** [**Analysis of forest seed 1917–18.**] Dansk Skovforenings Tidsskr. 4: 8–12. 1919.

1394. RAFN, JOHANNES. **Skovfrøanalyser i Saesonen 1918–19, samt lidt om Egern.** [**Tests of forest seed, 1918–19, with notes on the oak.**] Dansk Skovforenings Tidsskr. 5: 55–64. 1920.

1395. RAO, B. INAMATI SHAM. **Brief note on the artificial raising of sandal in the Akola Division of the Berar Circle, Central Provinces.** Indian Forester 46: 1–10. *Pl. 1–2.* 1920.—Sandal seed was dibbled in the brush of Akola and in good years an excellent stand resulted. As the sandal coppices and spreads by root suckers, the future stands are well assured.—*E. N. Munns.*

1396. RECKNAGEL, A. B. **Inspection, supervision and control of private forestry measures: methods and costs.** Jour. Forestry 18: 23–25. 1920.—There are nearly 300 timber land owners in New York with more than 500 acres in their holdings. To administer these properly would require technical supervision. Working plans for each tract should be prepared by a forester and filed with the Conservation Commission, failure to do so to be punished and violations of the plan carry fines. An office for handling these operations on 2,182,000 acres is needed with a mobile field force.—*E. N. Munns.*

1397. RECORD, S. J. **Possum wood.** Sci. Amer. 122: 569. 1920.—Descriptive of the tree and its wood, known by many common names, and botanically as *Hura crepitans.* This is one of the most recent introductions to the American timber market that seems certain to find a place.—*Chas. H. Otis.*

1398. [RIDSDALE, P. S.] **A decade of progress in the Forest Service.** Amer. Forestry 26: 131–132. 1920.—An editorial, occasioned by the retirement of HENRY S. GRAVES as head of the U. S. Forest Service, in which is reviewed the progress made during the ten years in which he has directed the forestry activities of the national government.—*Chas. H. Otis.*

1399. [RIDSDALE, P. S.] **Increase in forest research necessary.** Amer. Forestry 26: 69–70. 1920.

1400. [RIDSDALE, P. S.] **Light burning is a mistake.** Amer. Forestry 26: 68–69. 1920.—Light burning means nothing more nor less than the continuance of the frequent surface fire, which steadily and irresistibly destroys the western pine forests. At its best, the practice is

simply a measure for the protection of old timber. An area cleaned by light burning has no advance young growth to replace the virgin timber after cutting. Light burning has no place in a system of forestry which seeks to perpetuate our western pine forests and make them continuously productive.—*Chas. H. Otis.*

1401. [Ridsdale, P. S.] **A national forest policy.** Amer. Forestry 26: 67–68. 1920.

1402. Sherrett, R. G. **Multiple production—a new slogan.** Sci. Amer. 122: 58–59, 72. *5 fig.* 1920.—Touches, among other things, on the waste of lumbering and some of the ways in which this waste may be lessened.—*Chas. H. Otis.*

1403. Skoien, Olaf. **Landsskogtakseringen. [Taxation of the forests.]** Tidsskr. Skogbruk 28: 12–15. *1 fig.* 1920.

1404. Smith, Annie Lorrain. **Hyphomycetes and the rotting of timber.** Trans. British Mycol. Soc. 6: 54–55. 1918.—See Bot. Absts. 3, Entry 2763.

1405. Smith, F. H. **Significant trends in lumber production in the United States.** Amer. Forestry 26: 143–147. *1 map, 2 tables.* 1920.

1406. Smith, F. H. **What our forests support.** Amer. Forestry 26: 16–17. 1920.—A consideration of the great value of forests and their economic importance to the wealth, independence and prosperity of U. S. A.—*Chas. H. Otis.*

1407. Sparhawk, William N., Donald Bruce, and Burt P. Kirkland. **Report of subcommittee on forest leasing, forest loans, and forest insurance.** Jour. Forestry 18: 260–274. 1920.—The details of a leasing plan are given whereby the government can lease forest land instead of buying it outright, the financial burden being distributed over a long period. Financial credit to forest users is at high interest rate because of the small units and a system of Federal Forest Loan Boards is described. To handle forest insurance properly an insurance organization is necessary and as a public necessity is at stake and a resource in danger, this work can best be accomplished by a national organization. To these ends, legislation by the states and by the government is essential.—*E. N. Munns.*

1408. Stevens, Carl M. **Rating scale for foresters.** Jour. Forestry 18: 143–150. 1920.

1409. Terry, E. I. **Further comment on a formula method of estimating timber.** Jour. Forestry 18: 160–161. 1920.

1410. Vestby, P. **Spredte traek fra en skogbefaring i Chili. [Sketches from a trip to Chilean forests.]** Tidsskr. Skogbruk 28: 17–27. *Pl. 2.* 1920.

1411. Vikhammer, P. **Om granen som fremtidig skogtre nordenfor polarcirklen. [Norway spruce as a future tree north of the Polar Circle.]** Tidsskr. Skogbruk 27: 253–276. *Fig. 4.* 1919.

1412. West, Erdman. **An undescribed timber decay of hemlock.** Mycologia 11: 262–266. 1919.

1413. Williams, I. C. **Report of forestry.** Bull. Pennsylvania Dept. Agric. 11: 119–122. 1918.—Remarks upon the loss of services of state foresters who entered war service and its effect upon forest protection. Brief statistics are given of plantings within the state forests and of the available seeds and seedlings for future planting. The number of forest fires recorded in 1917 was 2066 and the average area burned over 153.45 acres. The railroads within the state paid damages on 168 fires, the expense of extinguishing the same being $1674.80. Individuals made settlement for 81 fires, the expense of which amounted to $1016.73. During 1917 the state forests were increased by 5593 acres, bringing the total area to 1,017,773 acres.

At the present time there are 52 state forests. It is pointed out that the State Department of Forestry has to 1918 paid from its resources $148,052.33 to the State School Fund of Pennsylvania.—*C. R. Orton.*

1414. WILSON, ELLWOOD. **Use of seaplanes in forest mapping.** Jour. Forestry 18: 1-5. 1920.—Seaplanes in eastern Canada were found well adapted for forest use, the abundance of lakes and the absence of landing grounds making such a type of plane feasible. Hardwoods and softwoods can readily be distinguished and photographs with an aerial camera gave excellent results in mapping, 200 square miles a day being possible with a machine as against 50 square miles per month by a party of ten on foot.—*E. N. Munns.*

1415. WOODRUFF, GEORGE W. **Constitutionality of national laws to restrict forest devastation.** Jour. Forestry 18: 100-102. 1920.—The Supreme Court, U. S. A., has upheld previous legislation dealing with the control of forest lands because of the benefit to the public and liberty of posterity. The present scheme for control of devastation fits in with the past favorable decisions.—*E. N. Munns.*

1416. WOOLSEY, THEODORE S., JR. **Early Arizona problems.** Jour. Forestry 18: 135-142. 1920.

1417. WOOLSEY, T. S. **Natural regeneration of French forests.** Amer. Forestry 26: 77-81. *10 fig.* 1920.—In the Landes and the Gironde maritime pine matures in 70-80 years, at which time the trees are clear cut. The branches and unmerchantable tops are left on the ground; the sun opens the cones and the sand is quickly covered with a stand so dense as to require thinning. In the sapling stage the excess trees are tapped to death to produce resin and mine props and to favor the development of the crowns of the final stand. The sessile oak in the Adour, where there is an annual acorn crop, can be clear cut. Sessile and pedunculate oak stands (often mixed with beech in central France) must be regenerated by progressive cuttings. Oak matures in 180-240 years and the seedlings are intolerant, while the beech requires for a time a protective cover of older trees. Under these conditions there are 3 successive fellings; the seed felling aims at starting the seedlings, the development of the crowns of the seed trees and the partial removal of the merchantable crop; a secondary felling aims to gradually remove the seed trees and to gradually free the existing seedlings without causing too much damage; the final felling is made when the ground is seeded and the first seedlings have developed into saplings, and in this the seed trees that are left are removed at one stroke. In fir stands, where advance growth almost always exists, the seed felling is really a light secondary felling, designed to allow this advance growth to develop. Subsequent secondary fellings are also light; but the final felling should be complete. In the high mountains the treatment is different, since the objective is not solely the production of lumber, but the slopes must above all be protected to avoid damage by erosion. Group selection is the method practised. Soil preparation is often necessary, especially with spruce, since natural regeneration is hampered by (1) a dense vegetable cover which prevents the seed coming in contact with the mineral soil, (2) an excessive cover of undecomposed dead needles or (3) too compact surface of the soil.—*Chas. H. Otis.*

1418. YATES, HARRY S. **The growth of Hevea brasiliensis in the Philippine Islands.** Philippine Jour. Sci. 14: 501-523. *1 fig.* 1919.—This paper has to do with the possibilities of cultivating Hevea in the Philippines on a commercial scale. The necessary conditions of climate, temperature, soil, and elevation are described. A comparison of these conditions with those of regions where *Hevea* is successfully cultivated indicates the suitability of the Islands for its cultivation, and the yield of rubber is satisfactory.—*Albert R. Sweetser.*

GENETICS

G. H. Shull, *Editor*
J. P. Kelly, *Assistant Editor*

1419. A., D. **The doubling of the stock.** Gard. Chron. 66: 157. Sept. 20, 1919.—Author cites references contradicting Mr. Taylor, who states that Lothian growers succeed in obtaining double flowers from single-flowered plants without selection. It seems that seed selection must be made from plants showing tendency to doubling.—*A. C. Hildreth.*

1420. Abl [Zuchtinspektor, Halle, Sachsen]. **Unfruchtbare Zwillinge beim Rind.** [Sterile twins in cattle.] Deutsch. Landw. Tierzucht. 22: 34-35. 1918.—Author reviews briefly the theory of Keller and Tandler in regard to the sterility and malformation of the free-martin heifer and describes two extreme examples.—*Sewall Wright.*

1421. Allen, Ezra. **Studies on cell division in the albino rat (Mus norvegicus, var. alb.). III. Spermatogenesis: the origin of the first spermatocytes and the organization of the chromosomes, including the accessory.** Jour. Morph. 31: 133-185. *58 fig.* June, 1918.—A technique which prevents clumping of the chromosomes is described. In the albino rat, the spermatogonial number of chromosomes is 37; the accessory divides in the second maturation division. Shapes of the chromosomes in spermatogonia are all curved rods; in first spermatocytes occur simple and compound rings, crosses, and one rod, the accessory; in the second spermatocytes, curved rods. The constitution of the first spermatocyte chromosomes is typically tetrad, with the four parts so organized that each may retain its individuality. The first spermatocyte chromosomes pass through clearly marked leptotene, pachytene, and diplotene stages without synizesis.—*Bertram G. Smith.*

1422. Alverdes, F. [German rev. of: Boas, J. **Zur Beurteilung der Polydaktylie des Pferdes. (Polydactyly in the horse.)** Zool. Jahrb. Anat. 4: 49-104. 1917.] Zeitschr. indukt. Abstamm. Vererb. 22: 287-288. May, 1920.

1423. Alverdes, F. [German rev. of: Lebedinsky, N. G. **Darwins geschlechtliche Zuchtwahl und ihre arterhaltende Bedeutung. (Darwin's sexual selection and its significance for the maintenance of species.)** Habilitationsvortrag. *31 p.* 1918.] Zeitschr. indukt. Abstamm. Vererb. 22: 282-283. May, 1920.

1424. Alverdes, F. [German rev. of: (1) Naef, A. **Die individuelle Entwickelung organischer Formen als Urkunde ihrer Stammesgeschichte. (Kritische Betrachtungen über das sogenannte "biogenetische Grundgesetz.")** (**The individual development of organic forms as evidence of their evolutionary history.—Critical consideration of the so-called "biogenetic law."**) *77 p., 4 fig.* Jena, 1917. (2) *Idem.* **Idealistische Morphologie und Phylogenetik. (Zur Methodik der systematischen Morphologie.)** (**Idealistic morphology and phylogeny.—On the method of systematic morphology.**) *77 p., 4 fig.* Jena, 1919.] Zeitschr. indukt. Abstamm. Vererb. 22: 279-282. May, 1920.

1425. Alverdes, F. [German rev. of: Plate, L. **Verbungsstudien an Mäusen.** (**Inheritance studies on mice.**) Arch. Entwicklungsmech. Organ 44: 291-336. *5 fig.* 1918. (See Bot. Absts. 3, Entry 658.)] Zeitschr. indukt. Abstamm. Vererb. 22: 284-285. May, 1920.

1426. Alverdes, F. [German rev. of: (1) Schaxel, Julius. **Grundzüge der Theorienbildung in der Biologie. (Principles of theory formation in biology.)** G. Fischer: Jena, 1919. (2) Schaxel, Julius. **Über die Darstellung allgemeiner Biologie. (On the presentation of general biology.)** Abhandl. Theoret. Biol. 1919.] Zeitschr. indukt. Abstamm. Vererb. 22: 276-279. May, 1920.

1427. ANONYMOUS. **Report of the work of the plant breeding division for 1919.** Jour. Dept. Agric. Ireland 20: 102–107. 1920.—This report contains a brief summary of the work on wheat, barley, oats, flax and rye grass. It is stated that several new forms of spring wheat have been developed from a cross between Red Fife and April Red. It is planned to substitute one of these new forms for Red fife.—Hybrid barleys are compared with their parents and indicate slight increases in yield in some cases with deviations in others. Single plant selections were made in a crop sown with commercial Riga flax seed. The progeny of each of these selected plants was found to be remarkably uniform, not only in botanical characters but also in physiological characters such as resistance to frost, period of growth and vigor. The two progenies were found to be superior to the others and the propagation of them was continued. Twenty acres were sown from the two superior progenies and the plants showed great uniformity of growth.—In addition to these two selections, further selections were made from Riga flax and of these last selections two appear superior to the best two of the first selection. —Selections were also made of white-flowered and Kostroma flax. The results of these selections are not reported.—Single plant selections are being made in Perennial and Italian rye grass but no report of the success of this work is given.—*J. H. Kempton.*

1428. ANONYMOUS. **Daffodil breeding.** Florists' Exchange 49: 1082. May 8, 1920.—Notes on daffodil breeding in America and England. Finest English daffodils are raised by S. GOODELL of Seattle, Washington, from crossing English varieties. Some flowers measure 11 cm. and display exquisite coloring. Author describes choice collection of seedlings (red cups and red eyes) shown at Royal Horticultural Society's Daffodil show in London on April 13, raised by MRS. R. O. BACKHOUSE. Prices for best new seedlings range from $250 per bulb to $100 or less.—*Orland E. White.*

1429. ANONYMOUS. **A new dahlia of interest to plant breeders.** Jour. Heredity 11: 48. Jan., 1920.

1430. ANONYMOUS. **The heredity and environment of a great botanist.** Jour. Heredity 11: 6. Jan., 1920.

1431. ANONYMOUS. **University wants photographs of twin calves.** Jour. Heredity 11: 15. Jan., 1920.

1432. ANONYMOUS. **A genetic association in Italy.** Jour. Heredity 11: 45. Jan., 1920.

1433. ANONYMOUS. **New eugenics society in Hungary.** Jour. Heredity 11: 41. Jan., 1920.

1434. ANONYMOUS. **The birth rate in mixed marriages.** Jour. Heredity 11: 96. Feb., 1920.

1435. ANONYMOUS. **Eugenics in Germany.** Jour. Heredity 11: 110. Mar., 1920.

1436. ANONYMOUS. **Eugenics in Scandinavia.** Jour. Heredity. 11: 128. Mar., 1920.

1437. ANONYMOUS. **Eugenics and other sciences.** Jour. Heredity 11: 77–78. Feb., 1920.

1438. ANONYMOUS. **A common misconception concerning human heredity.** Jour. Heredity 10: 275. June, 1919.

1439. ANONYMOUS. **A factor influencing the sex-ratio.** Jour. Heredity 10: 256. June, 1919.

1440. ANONYMOUS. **Measuring intelligence.** Jour. Heredity 11: 86–87. *1 fig.* Feb., 1920.

1441. ANONYMOUS. **Deficiency in intellect found to be correlated with deficiency in the number of brain cells.** Jour. Heredity 10: 369. Nov., 1919.

1442. Anonymous. **A supposed sheep-goat hybrid.** Jour. Heredity 10: 357-359. *2 fig.* Nov., 1919.

1443. Anonymous. **Carriers of the germ plasm.** Jour. Heredity 10: 422. *Fig. 81.* Dec., 1919.

1444. Anonymous. **To increase the birth rate.** Jour. Heredity 11: 64. Feb., 1920.

1445. Anonymous. **An award of honor to Walter Van Fleet.** Jour. Heredity 11: 95-96. *1 fig.* Feb., 1920.

1446. Anonymous. **The death of Richard Semon.** Jour. Heredity 11: 78-79. Feb., 1920.

1447. Anonymous. **Systematic breeding.** Florists' Exchange 49: 986. April 24, 1920.—Popular discussion of breeding, with remarks on the importance of the F_2 generation in crossing work. Breeding problems of the carnation, rose, cyclamen and sweet pea are discussed.—*Orland E. White.*

1448. Anonymous. **Historia de los metodos de seleccion. [History of the methods of selection.]** Jalisco Rural [Mexico] 2: 7-8. 1919.—Popular.

1449. Anthony, Stephen, and Harry V. Harlan. **Germination of barley pollen.** Jour. Agric. Res. 18: 525-536. *2 pl., 2 fig.* Feb. 16, 1920.—Experiments with barley pollen were carried on: (1) with solutions, (2) with moist chambers, (3) fertilization in the field, (4) retention of viability in the laboratory, (a) when pollen is left in free air; (b) when pollen is kept over sulphuric acid; and (c) when pollen is kept in vacuo. No germinations were secured either with water or solutions of sugar, agar, or nutritive substances of various osmotic concentrations. Germination was finally obtained as follows: A slide containing pollen was placed inside a Van Tieghem cell; a piece of mesophyll from a leaf of garden pea was placed in the cell to supply water; the cell was covered with cover glass and placed outside on window ledge. Germination was thus obtained in five minutes. In field experiments receptivity of stigma and duration of viability of pollen were studied and results compared with those of laboratory experiments. Extreme delicacy of water adjustment is the most noticeable response of the pollen to treatment given in the experiments. Literature is reviewed. [See also Bot. Abstr. 5, Entry 949.]—*W. E. Bryan.*

1450. Babcock, E. B. **Crepis—a promising genus for genetic investigations.** Amer. Nat. 54: 270-276. May-June, 1920.—It is desirable to find a genus with several crossable species, whose chromosome numbers are low and different; linkage groups corresponding to the chromosomes of each species should be understood. *Crepis* has 200 widely scattered and diversified species. Of these one is already known to have 3 chromosome pairs, 6 or 7 have 4, 4 have 5, one has 8, one has 9, and one has 20. Cytologically these are unusually favorable objects of study. *Crepis* is prolific, usually self-fertile, gives 2 or 3 generations a year, and probably its species are crossable. Disadvantage is smallness of flowers, making hybridization tedious though not impossible. Author has already commenced work on two species *virens* and *tectorum*, and urges other investigators to join in the attack, since an enormous mass of data will be necessary before the desired goal is reached.—*Merle C. Coulter.*

1451. Bancroft, Wilder D. [Rev. of: Jaeger, F. M. **Lectures on the principles of symmetry.** *18 x 27 cm. xii + 333 p.* Elsevier Publ. Co.: Amsterdam, 1917.] Jour. Phys. Chem. 23: 516. 1919.—The book deals with the principles of symmetry in chemical substances, animals and plants. "While not easy reading, the book is an instructive one and contains a great deal that is of interest" to all morphologists, especially those in botany who are also interested in evolution.—*H. E. Pulling.*

1452. Banta, Arthur M. **Sex and sex intergrades in Cladocera.** Proc. Nation. Acad. Sci. [U. S. A.] 4: 373-379. Dec., 1918.—Certain species of *Cladocera*, as *Daphnia pulex*, *Simo-*

cephalus serrulatus and three species of *Miona*, showed no intergradation of the secondary sex characters. In other species, however, as *Simocephalus vetulus*, sex-intergrades appeared very infrequently and in *Daphnia longispina* they were not very unusual. Frequently, in *Simocephalus vetulus*, there were many male intergrades produced with the female intergrades, but in *Daphnia longispina*, the intergrades were nearly all females. Sex intergrades appeared in certain cultures of *Simocephalus vetulus* in the 131st generation, in 1915, and have continued to appear throughout the 57 subsequent generations in the following three years. The females that showed only slightly developed intergrading sex characters reproduced with normal vigor but those with fully developed male characters were sterile.—*D. D. Whitney.*

1453. BARNILS, PÈRE. **Les éléments héréditaires dans le langage. [The hereditary elements in language.]** Compt. Rend. Soc. Biol. 82: 828-829. 1919.

1454. BARTLETT, J. T. **A plant-breeder's opportunity.** Sci. Amer. 121: 372. 1919.—Desirable varieties of fresh vegetables and fruits are already available, but breeder now has notable opportunity in developing varieties adapted to such by-product industries as canning and evaporating. Special demands made, such as low water content, strawberries which husk easily, etc. Emphasizes that canners and evaporators use first-quality produce, not produce unsuitable for shipment in fresh condition.—*Merle C. Coulter.*

1455. BAUIN, P. **Sur la dimégalie des spermies dans certaines doubles spermatogénèse. Sa signification. [On dimegaly of sperms in certain cases of double spermatogenesis. Its significance.]** Compt. Rend. Soc. Biol. [Paris] 83: 432-434. Mar., 1920.

1456. BAUMANN, E. **Zur Frage der Individual- und der Immunitätszüchtung bei der Kartoffel. [On the question of individual selection in potatoes and the breeding for immunity.]** Fühlings landwirtsch. Zeitg. 67: 246-253. 1918.—Author points out the necessity of studying commercial potato varieties by means of clones. Data based on a number of individual selections vegetatively propagated from two varieties are presented. High yields are associated with an increase in number of tubers but a decrease in size. The percentage of starch in the tubers is lower in high yielders although the absolute amount of starch is greater.—Data on the influence of various leaf diseases in reducing yield is discussed. Author believes that the chief causes of "running out" in potatoes are leaf diseases.—*R. J. Garber.*

1457. BISHOP, O. F., J. GRANTHAM, AND M. J. KNAPP. **Probable error in field experiments with Hevea.** Agric. Bull. Federated Malay States 6: 596. 1918.

1458. BLARINGHEM, L. **Polymorphisme et fécondité du Lin d'Autriche. [Polymorphism and fecundity in Austrian flax.]** Compt. Rend. Soc. Biol. [Paris] 82: 756-758. 1919.

1459. BLARINGHEM, L. **Vigueur végétative compensatrice de la stérilité, chez les hybrides d'espèces de Digitales (D. purpurea et D. lutea). [Vegetative vigor compensating for the sterility in a species hybrid of Digitalis (D. purpurea and D. lutea).]** Compt. Rend. Acad. Sci. [Paris] 169: 481-483. 1919.—Reciprocal crosses of *Digitalis purpurea*, L., and *D. lutea*, L., give sterile progeny which surpass both parental species as follows:

	purpurea	*hybrid*	*lutea*
Height	50-150 cm.	150-185	40-80
Dry weight	150 g.	200-275	50
Duration of life	biennial	many years	triennial

First generation plants are very uniform. Reciprocal crosses do not differ in vegetative features but flowers differ in size, shape and color.—*D. F. Jones.*

1460. BLISS, A. J. **Hybridizing bearded Iris.** Gard. Chron. 67: 225. May 8, 1920.—Attempts to coördinate the results obtained by BLISS and by STURTEVANT as to genetic composition of certain *plicatas*, basing an explanation on the results of BATESON and PUNNETT's experiment with Emily Henderson sweet pea. [See also Bot. Abstr. 5, Entries 331, 1669.]—*J. Marion Shull.*

1461. Bonnevie, Kristine. **Polydaktyli i norske bygdeslegter. [Polydactyly in Norwegian peasantry.]** Norsk. Mag. f. Lägev. 6: 1-32. 1919.—In several families from different parts of Norway one and the same type of hereditary polydactyly occurs—a postaxial, asymmetrical polydactyly, mostly developed on the right side of the body. The extra finger (or toe) was always fixed at the base of the fifth finger, the metacarpalia showing no abnormalities. In all families the character in its occurrence follows the dominant type of inheritance, occurring in each of a series (2-5) of generations and in a relatively large number of individuals. The degree of development of the sixth finger (or toe) and its occurrence on one or both hands or feet, however, show considerable variation within each generation, from a well developed finger with three normal phalanges, down to a small soft knob at the side of the hand.—A genealogical investigation proved all the families in question to descend from one and the same parish of Norway and also to have at least one ancestor in common.—*Kristine Bonnevie.*

1462. Bonnevie, Kristine. **Om tvillingsfödslers arvelighet. Undersökelse over en norsk bygdeslegt. [On the inheritance of twin births. Investigations on Norwegian peasantry.]** Norsk. Mag. f. Lägev. 8: 1-22. 1919.—Hereditary disposition of twin births is stated within certain branches of a large country family (counting about 5000 individuals), the multiple births making in these branches no less than 7.7 per cent of all births, while the percentage of twin births within the whole country makes only 1.3-1.4 per cent. Through the "difference method" of Weinberg (subtraction of all twin "pairs" from the number of one-sexed twins) it is proved that about 80 per cent of all multiple births investigated should be considered as two-egged twin births, while probably only 20 per cent of multiple births have been from one egg. Younger mothers (below 30 years old) seem to give rise to one-egg and two-egg twin births in about equal number, while the number of one-egg twin births rapidly decreases among older mothers. The inheritance of two-egg twin births which must depend upon some hereditary character of the ovary is investigated through a genealogical study of the ancestry of twin mothers. Among 88 twin mothers 73 are shown to belong to twin-producing branches of the families investigated, while the ascendence of 15 twin-producing mothers is unknown. 67 twinning mothers whose ascendence is known through several generations on one (30 cases) or on both sides (37 cases) are without exception shown to descend from twin-producing families through both parents, or through the one of them whose ascendence is known. The type of inheritance seems, therefore, to be that of a recessive character demanding for its manifestation that the twinning mother should receive her disposition in a double dose, through both her parents. The investigations are being continued on other families and all results should as yet be considered as preliminary.—*Kristine Bonnevie.*

1463. Boulenger, G. A. **Un cas intéressant de dimorphisme sexuel chez un serpent africain (Bothrolycus ater Günther). [An interesting case of sexual dimorphism in an African snake.]** Compt. Rend. Acad. Sci. Paris 168: 666-669. 1919.—Sexes are distinguished by number of rows of scales, 19 in female, 17 in male. Variations in other species mentioned in literature are not related or are only indefinitely related to sex.—*A. Franklin Shull.*

1464. Burch, D. S. **Heredity and economical production of food.** Jour. Heredity 11: 7-11. *2 fig.* Jan., 1920.

1465. Burt, B. C., and N. Haider. **Cawnpore-American cotton: An account of experiments in its improvement by pure line selection and of field trials. 1913-1917.** Agric. Res. Inst. Pusa Bull. 88. *52 p., 10 pl., 1 fig.* 1919.—Describes effort to isolate pure lines adapted to Indian conditions from a badly mixed stock of an American upland variety.—*T. H. Kearney.*

1466. Call, L. E. **Director's report.** Kansas Agric. Exp. Sta. 1917-18. *63 p.* 1918.—Author states breeding parthenogenetic *Appotettix* indicates certain characters may be affected by temperature and moisture. Of several thousand parthenogenetic offspring, all were females except four. Parthenogenesis occurs among homozygotes and heterozygotes. "Crossing over" and "linkage" also occur.—Corn leaf aphis: *Aphis maidis*, reared at temperature of 84° to 90°F. produced no winged forms; reared at 72°F. one winged form appeared

among many hundred wingless ones; reared at temperature of 60° to 70°F. large numbers of winged forms appeared. "In entire 55 generations no males appeared."—Cereal crops: Author states Kanred winter wheat is markedly resistant to cold and certain strains of stem rust. Kansas Nos. 2414 and 2415 exhibit similar resistance.—Hessian fly seldom lays eggs on "oats, barley, einkorn, spring emmer, and durum wheat, and less abundantly on soft than on hard winter wheats." Very few "flax seeds" were developed on wheat varieties, Illini Chief, Dawson Golden Chaff, Beechwood Hybrid, and Currell Selection, although eggs were laid on them "in abundance."—Swine: Following tendencies have been noted: (1) Wide Berkshire forehead is dominant over medium forehead of Duroc Jersey and narrow forehead of Tamworth and wild hog, (2) Berkshire dish of face is recessive to straight face of Tamworth and wild hog, (3) Berkshire short face is completely recessive to Tamworth long face, (4) Erect ear of Berkshire is dominant over drooping ear of Duroc Jersey.—Apparently there are distinct hereditary differences between Berkshire and Duroc Jersey with respect to size, rate of growth and early maturity."—*Fred Griffee.*

1467. CARD, W. H. **Originating and standardizing a new variety of Cornish.** Reliable Poultry Jour. 26: 647, 672, 725, 748, 749, 817, 857, 858, 927, 975, 976. *8 fig.* 1919.—An account of the origin of the White Laced Cornish fowl, by its originator, a practical breeder.—*H. D. Goodale.*

1468. CARLE, E. **Sélection pédigrée appliquée à la variété de riz "Nàng Mèo."** [Pedigreed selection applied to the variety of rice known as "Nang Mèo."] Bull. Agric. Inst. Sci. Saigon. 2: 73-78. 1920.

1469 COHEN-STUART, C. P. **A basis for tea selection.** Bull. Jard. Bot. Buitenzorg. III, 1: 193-320. 1919.—A comprehensive study of the origin, distribution and cultivation of tea. The systematic treatment of the genus *Camellia* is thoroughly discussed and a synoptic key is given for the determination of the various species. There is appended also a list of the specimens contained in the herbaria of Kew, Buitenzorg, Singapore and Berlin. This article comprises the first of three sections of a paper on selection of tea.—*J. H. Kempton.*

1470. COLE, LEON J., AND HEMAN L. IBSEN. **Inheritance of congenital palsy in guinea-pigs.** Amer. Nat. 54: 130-151. Mar.-Apr., 1920.—A definite neurosis (congenital palsy), characterized by clonic spasms, particularly of the legs, appeared in stock of normal guinea-pigs. All affected animals die at or before two weeks after birth. Defect is due to Mendelian recessive. DR × DR gave 183 normal, 63 palsied. Tested normals from this mating gave 7 DD and 15 DR. Variations of symptoms are noted and discussed. Defect is due to a factor mutation, cause unknown. Comparison is made with certain hereditary motor disturbances in pigeons, mice, rats, rabbits, goats, sheep, man and progeny of alcoholized guinea-pigs, none of which cases are considered identical with congenital palsy observed by the writers.—*C. C. Little.*

1471. COLE, LEON J. **An early family history of color blindness.** Jour. Heredity 10: 372-374. *1 fig.* Nov., 1919.

1472. COLLINS, G. N., AND J. H. KEMPTON. **Heritable characters of maize. I. Lineate leaves. Description and classification of lineate plants—value of maize as material for investigation, and economic importance of discovering latent variations.** Jour. Heredity 11: 3-6. Jan., 1920.

1473. COOK, O. F., AND ROBERT CARTER COOK. **Biology and government. Further discussion of Alleyne Ireland's article on democracy and the accepted facts of heredity.** Jour. Heredity 10: 250-253. June, 1919.

1474. COOK, O. F. **A disorder of cotton plants in China: Clubleaf or cyrtosis.** Jour. Heredity 11: 99-110. *9 fig.* Mar., 1920.

1475. COOLEY, CHARLES H. **A discussion of Popenoe and Johnson's "Applied eugenics" and the question of heredity vs. environment.** Jour. Heredity 11: 80–81. Feb., 1920.

1476. CORRENS, C. **Fortsetzung der Versuche zur experimentellen Verschiebung des Geschlechtsverhältnisses.** [Continuation of experiments on artificial shifting of sex relations.] Sitzungsber. Preuss. Akad. Wiss. Berlin 1918: 1175–1180. 3 *fig.* 1918.

1477. COULTER, MERLE C. **Inheritance of aleurone color in maize.** Bot. Gaz. 69: 407–425. May, 1920.—An attempt was made to test the certainty with which predicted aleurone ratios would be fulfilled in complicated crosses. Crosses were made involving the *Rr Cc* and *Pp* factors in such a way as to require eight different ratios. The general conclusion is reached that the expectation in these cases is reasonably fulfilled. Seeds of different shades of color were separated and planted to determine whether it was possible to recognize genotypes by the intensity of the color. The author concludes that with experience genotypes may be separated by this method, particularly among red seeds. The inheritance of faintly colored or parti-colored seeds was studied. It is assumed that such seeds lack the aleurone factor *C* but have some partial substitute which is very erratic in its effect on the expression of color. An unusual case is reported where a plant known to have the factorial composition *Pp rr Cc* gave, when selfed, an ear with a perfect ratio of 9 colored to 7 white seeds. It is believed in this case that some unusual condition is present which produces purple aleurone when combined with the factors *PC* but colorless aleurone in combination with *C* only. Practically all the grains on this ear had irregularly split pericarps and when planted germinated slowly or not at all with a subsequent slow and stunted growth, suggesting that the aleurone ratio may be due to pathological causes. Crosses in which EMERSON'S *R*-tester was used as the male parent and *C*-tester as the female parent (*PPRRcc* × *PPrrCC*) were found to have only self purple seeds but when the parentage was reversed (*PPrrCC* × *PPRRcc*) all the seeds were mottled. This confirms the results of EMERSON from whom the material was received. In various crosses of EMERSON'S *C* and *R* testers with material obtained from East, the author concludes that these investigators have given similar symbols to the same set of factors. A study of mottling led to the conclusion that it can appear only when the *R* aleurone factor enters the seed from the male parent and then only when some other condition is present. This other condition was found in EMERSON'S *C*-tester. A very small percentage of mottled seeds is obtained where no mottling is to be expected, in some crosses involving *R*-tester. Such mottled seeds are believed to differ genetically from the mottling in the crosses involving *C*-tester.—It was found that there were no differences in the inheritance of aleurone color between inflorescences on the main stalk and suckers, but there was evidence, not given, that differences might be expected in the inheritance of plant colors, particularly chlorophyll, between the main culm and lateral branches.—A further test of the variability in inheritance which may occur between different parts of the same plant was obtained by self-pollinating both ears of two-eared plants. In most cases the two ears were reasonably alike but in some instances significant differences were found. The agreement between the two ears of the same plant is especially poor where faint aleurone color is involved.—The chance distribution of the different-colored seeds on the ear was tested and found to hold for starchy-sweet and colored-colorless but on ears where less than 10 per cent of the grains were particolored the majority of spotted grains were found in groups of 4 or 5, indicating the influence of local conditions. With respect to this phenonemon the author believes that local conditions on the ear do not determine but merely limit the appearance of particolored aleurone.—*J. H. Kempton.*

1478. COWGILL, H. B. **Cross-pollination of sugar cane.** Jour. Dept. Agric. Porto Rico 3: 1–5. Jan., 1919.—Method used at Insular Experiment Station of Porto Rico is satisfactory and many seedlings are produced. Bags are made of cheese cloth 48 inches long and 18 wide, held extended by heavy wire rings sewed into them. Rings placed one at top and other 16 inches from bottom so that a skirt of 16 inches is left to be drawn in and tied about stems of panicles. Bags are supported over panicles by means of bamboo poles set in ground with cross-bar at top. Poles are set to windward side of stools just before panicles "shoot;"

when panicles shoot, the bag is immediately suspended over each panicle and tied around its stem so that it is protected from undesirable pollen before any florets open. Cane blossom is hermaphrodite but some varieties are almost completely self-sterile, making it possible to cross-pollinate with another variety with assurance that nearly all offspring will be hybrids of the two chosen varieties. Pollinating is done by placing panicles of desired variety in bag, in such position that pollen will be shed or carried by wind or insects to florets of other variety as they open. One or two panicles are used at a time, allowed to remain in bag two or three days, being renewed as often as necessary. It is found advantageous to cut stems 4 to 6 feet long and put cut end in joint of bamboo filled with water, thus keeping fresh 2 or 3 days. —Results: 1915–1916. Ten crosses attempted, eight produced seedlings, majority of which showed characteristics of both parents. About 1500 seedlings produced, one panicle yielding over 1000.—1916–1917. Thirty crosses made comprising nine different combinations, of which nineteen were successful. From one combination 1309 seedlings were obtained and in all 2589 were produced.—1917–1918. Thirty crosses were attempted, comprising nine combinations. Fifteen were successful and 1794 seedlings were produced, 157 from one combination, 735 from another.—Effect of crossing: In 1915–1916 and 1916–1917 pollinator was dark-colored cane while seed-parent was medium light, and dark color of pollen parent was seen in many of offspring.—At least two of old standard varieties are nearly pollen-sterile here (Crystalline and Rayada).—*E. E. Barker.*

1479. CUNNINGHAM, J. T. **Results of a Mendelian experiment on fowls, including the production of a pile breed.** Proc. Zool. Soc. London 1919: 173–202. *1 pl.* Sept., 1919.—A male black-red *Gallus bankiva* was crossed to a silky hen. Data on inheritance of plumage, skin pigmentation, comb, booting and crest are given. The production of a pile race from the cross, which bred true, is described. "The simplest explanation" of its origin "is that segregation is not complete or perfect . . . ." Attempts to increase amount of pigmentation in the piles by repeated back-mating to normals did not result in any consistent increase. —*H. D. Goodale.*

1480. DANFORTH, C. H. **Resemblance and difference in twins.** Jour. Heredity 10: 399–409. *Frontispiece, fig. 1–14, 20, 22–30.* Dec., 1919.

1481. DANIEL, L., AND H. TEULIÉ. **Extension des limites de culture de la vigne au moyen de certains hybrids. [Extension of the limits of culture of the grape by means of certain hybrids.]** Compt. Rend. Acad. Sci. Paris 166: 297–299. 1918.

1482. DAVENPORT, C. B. **A strain producing multiple births.** Jour. Heredity 10: 382–384. Nov., 1919.

1483. DELAGE, Y., AND M. GOLDSMITH. **Le Mendelisme et le mécanisme cytologique de l'hérédité. [Mendelism and the cytological mechanism of heredity.]** Rev. Sci. Paris 57: 97–109, 130–135. 1919.—Part I is a brief summary of Mendelism, "Neo-Mendelism" and the chromosome theory of heredity, including the factorial hypothesis, the phenomena of linkage, crossing over and non-disjunction and the chromosomal mechanism of sex determination. Mendelism is compared with Weismannism. Credit NAUDIN with many discoveries attributed to MENDEL. Mention influence of environment and cytoplasmic inheritance. Part II is a critique of Mendelism (or Neo-Mendelism). Acknowledge great advances and brilliant achievements in this field but think Mendelians are blinded to the uncertainties, defects, lacunae and improbabilities of the theory and the fragility of the objective bases upon which it rests. Illustrate (1) by questioning continuity of chromosomes because these are not visible in resting stage, (2) by questioning linear arrangement of genes because chemical differentiation of chromatin within individual chromosomes has not been demonstrated, (3) by contending that a force which will bring homologous chromosomes into such intimate and accurate alignment as necessitated by crossover hypothesis will not permit them to lie X-wise and give crossovers, and (4) by maintaining that Mendelian conception gives no explanation of successive appearance of characters in ontogeny or, (5) of the origin of new characters during evolution. Predict downfall of Mendelism from weight of accessory hypotheses needed to explain special cases.—*C. W. Metz.*

1484. Demoll, R. **Zur Frage nach der Vererbung vom Soma erworbener Eigenschaften. [On the question of the inheritance of acquired characters.]** Arch. Entwicklungsmech. Organ. **46: 4–11.** *3 fig.* 1920.

1485. Detjen, L. R. **A mutating blackberry—dewberry hybrid.** Jour. Heredity **11:** 92–94. *4 fig.* Feb., 1920.

1486. Detlefsen, J. A., and W. W. Yapp. **The inheritance of congenital cataract in cattle.** Amer. Nat. **54:** 277–280. May-June, 1920.—On mating the F_1 son of Holstein-Friesian bull 62924 to the F_1 daughters of this bull 8 F_2 offspring (2 ♀ and 6 ♂) with well-defined congenital cataracts of the stellate type to 55 F_2 normal offspring were produced. Ninety-three normal F_1 offspring of 62924 were produced. Pedigree studies of bull 62924 reveal no ancestors which had cataracts. Assuming the bull 62924 heterozygous the F_2 expectation is 55.125 normal + 7.875 cataractous. 62924 mated to his own daughters produced 7 offspring, 3 (1 ♂ + 2 ♀) of which were cataractous. It is concluded that congenital cataract in cattle is a simple recessive Mendelian character.—*John W. Gowen.*

1487. De Vries, Hugo. **Oenothera Lamarckiana erythrina, eine neue Halbmutante. [Oenothera Lamarckiana erythrina, a new half-mutant.]** Zeitschr. indukt. Abstamm. Vererb. **21:** 91–118. 1919.

1488. Doncaster, L. **The tortoiseshell tomcat. A suggestion.** Jour. Genetics **9:** 335–338. Mar., 1920.—Author criticizes Little's hypothesis of mosaic character of tortoiseshell tomcat and on basis of work of Chapin, Lillie, and Magnusson on free-martin and of Cutler and Doncaster on histology of testis of sterile tortoiseshell tomcat, suggests that latter be a masculized female.—*P. W. Whiting.*

1489. Doncaster, L., and H. G. Cannon. **On the spermatogenesis of the louse (Pediculus corporis and P. capitis), with some observations on the maturation of the egg.** Quart. Jour. Microsc. Sci. **64:** 303–328. *1 pl., 1 fig.* Mar., 1920.—*P. corporis* has 12 chromosomes in somatic cells of both sexes. In the testis certain large cells, supposed to be follicular, also have 12. Other cells of testis, believed to be spermatogonia, have 6, apparently double, chromosomes. Spermatocytes, also with 6 chromosomes, pass through growth period followed by a very asymmetrical division, giving one large cell which develops into a spermatid and one small "polar cell" which degenerates. A conspicuous mitochondrial body remains in the large cell. No second spermatocyte division occurs. Centrosomes of spermatids are double and there are two axial filaments. No oögonial or oöcyte divisions were found. Author did not observe unisexual broods or sex-ratio disturbances described by Hindle. Spermatogenesis of *P. capitis* apparently agrees with that of *P. corporis.*—*C. W. Metz.*

1490. Duerden, J. E. **Methods of degeneration in the ostrich.** Jour. Genetics **9:** 131–193. *Pl. 5–6, 8 fig.* Jan., 1920.—Author describes type of degenerative changes observed in coverts, wing quills, down feathering, wing digits and toes, and regards these as suggestive of the manner in which degeneration proceeds, and as favorable data for throwing light on the nature of variation and method of evolution generally.—In his discussion of relation of the degenerative changes to adaptation, author concludes that, compared with other factors, such losses have little or no bearing upon the welfare of the ostrich; and hence, that natural selection has been inoperative in directing their course. "Natural selection may wipe out the race, but cannot guide its evolution."—Referring to ontogenetic and phylogenetic degeneration, author believes process of degeneration is in no way affected during the life of the individual, but only with the formation of the zygote; in plumes, scales and claws of embryos and chicks the degenerative changes are found expressed just as in the adult. "Degeneration may be defined as the somatic expression of a phylogenetic degradation and loss of genetic factors." —As to cause of degeneration, author acknowledges our ignorance on this point but believes they are certainly intrinsic as opposed to environmental. "The influence is so slowly acting . . . as to call for an aloofness, an independence, of external vicissitudes. Only something

in the organism itself, and beyond all varying somatic responses, could meet demands so continuous and so consistent." According to the author the agency at work possesses a strong determinate influence; and the evidence is of such a nature as to remind one of Nägeli's conception of a mystical, internal, vitalistic force. In the ostrich, it is suggested that the changes may be interpreted in terms of "a germinal senescence, perhaps expressing itself in factorial fractionation and loss." The author believes that the ostrich race may present us with an example of "mass mutation."—In conclusion, author discusses the possibility of factorial changes, but this point, with reference to the bearing of the ostrich data, is left inconclusive. —*P. B. Hadley.*

1491. ELDERTON, ETHEL M. [Rev. of: WHIPPLE, GEORGE CHANDLER. **Vital statistics: An introduction to the science of demography.** *12 x 18 cm., v + 517 p., 63 fig.* John Wiley & Sons, Inc.: New York, 1919.] Science Progress 14: 696–697. April, 1920.—See Bot. Absts. 3, Entry 2212.

1492. ELLINGER, TAGE. [German rev. of: PUNNETT, R. C., AND THE LATE MAJOR P. G. BAILEY. **Gefletic studies in poultry. I. Inheritance of leg feathering.** Jour. Genetics 7: 203–213. May, 1918. (See Bot. Absts. 1, Entry 492.)] Zeitschr. indukt. Abstamm. Vererb. 22: 288. May, 1920.

1493. ELLINGER, TAGE. [German rev. of: RASMUSON, HANS. **Über eine Petunia-Kreuzung. (On a petunia cross.)** Bot. Notiser 1918: 287–294. 1918. (See Bot. Absts. 3, Entry 2181.)] Zeitschr. indukt. Abstamm. Vererb. 22: 289. May, 1920.

1494. ELLINGER, TAGE. [German rev. of: RASMUSON, HANS. **Zur Genetik der Blütenfarben von Tropaeolum majus. (On the genetics of the flower colors of Tropaeolum majus.)** Bot. Notiser 1918: 253–259. Nov., 1918. (See Bot. Absts. 3, Entry 2180.)] Zeitschr. indukt. Abstamm. Vererb. 22: 288–289. May, 1920.

1495. ELLINGER, TAGE. [German rev. of: RAUNKIAER, C. **Om Løvspringstiden hos Afkommet af Bøge med forskellig Løvspringstid. (On leaftime in the descendants of beeches with different leaf times.)** Bot. Tidsskr. 36: 197–203. 1918. (See Bot. Absts. 2, Entry 42.)] Zeitschr. indukt. Abstamm. Vererb. 22: 289. May, 1920.

1496. EMERSON, R. A. **Heritable characters of maize. II. Pistillate flowered maize plants.** Jour. Heredity 11: 65–76. *8 fig.* Feb., 1920.

1497. EMOTO, Y. **Über die relative Wirksamkeit von Kreuz- und Selbstbefruchtung bei einigen Pflanzen. [On the relative effectiveness of cross- and self-fertilization in several plants.]** Jour. Coll. Sci. Imp. Univ. Tokyo 43: 1–31. *2 pl., 6 fig.* Mar. 15, 1920.

1498. ERDMANN, RHODA. **Endomixis and size variations in pure bred lines of Paramaecium aurelia.** Arch. Entwicklungsmech. Organ. 46: 85–148. *12 fig.* 1920.

1499. ERIKSON, J. **Platanthera bifolia × montana i Blekinge. [Platanthera bifolia × montana in Blekinge.]** Bot. Notiser 1918: 59–62. 1918.

1500. EULER, K. **Ein bemerkenswerter Fall von Knollen-Farbabänderung der Kartoffel. [A remarkable case of change of color in potato tubers.]** Deutsch. Landwirtsch. Presse 1919: 161–162. 1919.

1501. FAIRCHILD, DAVID. **Twins.** Jour. Heredity 10: 387–396. *Frontispiece, fig. 1–14, 20, 22–30.* Dec., 1919.

1502. FLEISCHMANN, R. **Die Auslese bei der Maiszüchtung. [Selection in maize breeding.]** Zeitschr. Pflanzenzücht. 6: 69–96. 1918.—Selection has been practiced since 1909 on the yellow horse-tooth variety of maize. The characters used were yield of grain, length and

number of rows on the ear, per cent of grain to cob, weight of 100 seeds, and time of maturity. —It was found that in selecting for yield of grain the best results were obtained when the progeny row was taken as the unit of selection rather than the individual plant, although positive results were obtained in either case.—Selection for number of rows was ineffective since the progenies regressed to a fourteen-rowed type regardless of whether the selection was made for a greater or less number of rows.—The per cent of grain to cob was found to be readily changed by selection but it was found also that the size of the cob was directly associated with the yield of grain. Care, therefore, must be exercised in selecting for an increased ratio of grain to cob, not to reduce the absolute size of the cob.—The author questions the value of many-eared strains and restricted selection to single-eared plants.—*J. H. Kempton.*

1503. Florin, Rudolf. **Zur Kenntnis der Fertilität und partiellen Sterilität des Pollens bei Apfel- und Birnensorten. [On the fertility and partial sterility of the pollen of different varieties of apple and pear.]** Acta Horti Bergiani 7: 1-39. 1920.—If there is self-sterility or insufficient power of germination of the pollen of a variety of fruit trees it is not advisable to grow the variety in question alone in great closed groups, but other sorts should be grown among them which produce plenty of pollen with great efficiency. Author has examined the power of germination of the pollen (in solutions of sugar of variable concentration) of 102 apple and 14 pear varieties, which are cultivated in Sweden. He gives a tabulated summary of 405 experiments, wherein he states date, time of examination, temperature, per cent of germination and maximum and minimum length of the measured pollen tubes.—Of the apples 24 sorts showed 0-30 per cent of germination; 13 showed 31-70 per cent; and 65 showed 71-100 per cent. The last group is of course the most preferable for use as pollenizers. A list of literature is given containing 27 citations.—*K. V. Ossian Dahlgren.*

1504. Foot, Katharine. **Determination of the sex of the offspring from a single pair of Pediculus vestimenti.** Biol. Bull. 37: 385-387. Dec., 1919.—A pair of fleas produced 143 fertilized eggs. Of these 125 hatched and the sex was determined for 115 of the young or 92 per cent of the total. There were 62 males and 53 females. The earlier-produced eggs yielded a higher percentage of females than males. Later the proportion of the sexes became equal and then, as the last eggs were produced, the earlier sex ratio was reversed—more eggs developing into males than females.—*D. D. Whitney.*

1505. Fraser, Allan Cameron. **The inheritance of the weak awn in certain Avena crosses and its relation to other characters of the oat grain.** Cornell Univ. Agric. Exp. Sta. Mem. 23: 635-676. June, 1919.—A study is made of the inheritance of the weak awn in *Avena* crosses. Burt oats were used as parent for the weak awn and Sixty Day for awnless. The reciprocal crosses indicated an approach to dominance of awnlessness. In F_2 generations, two distinct classes of the weak awn and awnless appeared with a variation between the two types of about all the possible differences between the parent sorts. These intermediate forms could not be separated into classes on a multiple factor basis. If all these intermediate forms were thrown into one class, there would be a close approximation to the 1:2:1 ratio. The fully awned type is evidently pure recessive. Data in F_3 or F_4 generations did not include the entire plant, the center spikelet only being used. This method was based upon results of Love and McRostie on the tendencies of the plant to agree in its characteristics with the terminal spikelet. The data seemed to show that both parents contain a factor for awning, but that the Sixty Day parent possesses an inhibitor linked with yellow color. The inhibitor seems to be affected in its power of inhibition by environmental factors. The partly awned plants in F_2 generations are shown to be heterozygous in successive progeny types. Spikelets with two awns on a kernel are found only on completely awned spikelets. Increase in soil moisture and nitrogen seems to decrease number of awns.—The appearance of strong and intermediate awns in F_2 and F_3 progenies is considered to be a reversion. There is strong linkage shown between medium long basal hairs and the awned condition. Short basal hairs or no hairs are dominant over long basal hairs.—With respect to color, the F_1 plants are intermediate. On account of the difficulty of determining color under weather conditions, the F_2 is not consid-

ered well classified. The Burt oat possesses a red factor and a yellow factor, which are quite distinct from the Sixty Day factor. The Sixty Day yellow factor inhibits awning. The Burt yellow carries no such inhibitor. The F_1 generation bears out most of the conclusions reached in F_2. The appearance of brown berries is attributed to mutation or reversion.—*Alvin Keser.*

1506. FRATEUR, J. L. **La robe sauvage du lapin. [The wild coat of the rabbit.]** Réunion Soc. Belge Biol. 1919: 941–943. 1919.

1507. FRETS, G. P. **De polymerietheorie getoetst aan de erfelijkheid van den hoofdvorm. [Theory of polymery tested in the inheritance of head-form.]** Genetica 2: 115–136. Mar., 1920.

1508. FRUWIRTH, C. **Neunzehn Jahre Geschichte einer reinen Linie der Futtererbse. [Nineteen-year history of a pure line of field peas.]** Fühlings landw. Zeitg. 69: 1–28. 1920.—Study of variations in a pure line, in sense of Johannsen, of field peas breeding absolutely true for three years to pink flowers and yellowish-green seed-coats. In succeeding years, "spontaneous variations" occurred from time to time such as plants with red-purple flowers and maple seed-coats, purple specked and purple-striped seed-coats, albino foliage, variegated yellow and green or more rarely green and white foliage, and plants that either died prematurely or set no pods or set pods, but matured no seeds. Detailed data given including tables, of selection and crossing experiments with some of the variants of this pure line. Only negative results obtained with selection lines. Variants may be regarded as phases of eversporting races, the variations arising either in vegetative cells or in sexual cells. In latter case parents of variants are hybrids, giving segregation ratios of a Mendelian type although these may be irregular. Some spontaneous variations such as red-purple flowers and maple seed-coats are dominants, while others such as albinism and other foliage-chlorophyll defects are recessive. Albino foliage variations appear first in a ratio of 3 green: 1 white, but the variation must have arisen in the sex cells two generations back, but since green foliage is dominant, did not appear except as members of an F_2 generation. Albinism and other chlorophyll defects appeared only in F_2 and later generations of cross of the "pure line" with a white-flowered green-foliage variety. Literature of chlorophyll defects is reviewed. "Disassociation" and "association" concept of TSCHERMAK is discussed; also "pluripotency" concept of HAECKER. Variations occurring in sex cells uniting with the unvarying sex cells appear as hybrids. Variations taking place in vegetative cells later give rise to sex-cells which unite and produce pure races of hereditary variations at once. Eversporting proclivity may express itself rarely in some races and as regards some characters.—*Orland E. White.*

1509. GAINES, E. F. **The inheritance of resistance to bunt or stinking smut of wheat.** Jour. Amer. Soc. Agron. 12: 124–132. 1920.—Bunt resistance to wheat is not a simple Mendelian unit character, but resistance, if Mendelian, is composed of multiple factors, for a continuous series ranging from complete immunity to complete susceptibility has been obtained. Different wheat varieties possess different kinds of resistance. Linkage between resistance and morphological characteristics is not sufficient to prevent the selection of a resistant strain of any morphological type desired.—*F. M. Scherts.*

1510. GALLOWAY, BEVERLY T. **Some promising new pear stocks.** Jour. Heredity 11: 25–32. *8 fig.* Jan., 1920.

1511. GAUGER, MARTIN. **Die Mendelschen Zahlenreihen bei Monohybriden im Lichte der Dispersionstheorie. [The Mendelian ratios in monohybrids in the light of the dispersion theory.]** Zeitschr. indukt. Abstamm. Vererb. 22: 145–198. Mar., 1920.

1512. GOLDSCHMIDT, RICHARD. **Intersexualität und Geschlechtsbestimmung. [Intersexuality and sex determination.]** Biol. Zentralbl. 39: 498–512. Nov., 1919.

1513. GOWEN, J. W. **Appliances and methods for pedigree poultry breeding at the Maine Station.** Maine Agric. Exp. Sta. Bull. 280: 65–88. *13 fig.* 1919.—This is a revision of an earlier bulletin on the same subject.—*H. D. Goodale.*

1514. Grantham, J., and M. D. Knapp. **Field experiments with Hevea.** Agric. Bull. Federated Malay States 6: 596-597. 1918.

1515. Grantham, J., and M. D. Knapp. **Field experiments with Hevea.** Arch. Rubbercultuur 2: 614-630. 1918.

1516. Green, Heber. **The application of statistical methods to the selection of wheat for prolificacy. Agricultural research in Australia.** Advisory Council Sci. and Ind. Commonwealth of Australia Bull. 7: 49-56. 1918.—Author discusses application of familiar biometric methods and points out their limitations in wheat breeding. Experiments have been conducted for seven generations in selecting the heavy-, medium-, and light-yielding plants of wheat. Progress in both directions resulted, though apparently much more rapid, in the direction of high yield.—In an attempt to develop a wheat suitable for semi-arid climates an unusually severe season destroyed all but three plants in a plot. One of these three was a giant, the progeny of which has given rise to a valuable strain.—*J. H. Kempton.*

1517. Haecker, V. **Eine medizinische Formulierung der entwicklungsgeschichtlichen Vererbungsregel.** [A medical formulation of the developmental law of heredity.] Deutsch. Med. Wochenschr. 44: 124-126. 1919.—The author's "developmental law of heredity" [See Bot. Abstr. 4, Entry 588] is briefly explained and illustrated. In general the clearness with which a trait segregates in heredity is a function of the autonomy of that trait in development. Hereditary defects occurring in organs with a high degree of developmental autonomy tend to follow simple Mendelian rules in heredity while those dependent for their manifestation on disharmonies in several organs or systems (e.g., diabetes) do not do so. Cases in which the same organ shows different defects in various members of the same family, are interpreted as indicating an early autonomy of the organ in question with a more or less generalized weakness of that organ in the particular family concerned.—*C. H. Danforth.*

1518. Harlow, H. V., and H. K. Hayes. **Breeding small grains in Minnesota. II. Investigations in barley breeding.** Minnesota Agric. Exp. Sta. Bull. 182: 45-56. *4 fig.* Mar., 1919.—Two lines of investigation (pure-line and hybridization) are discussed as methods of barley improvement. From selections of domestic and foreign sorts it was found that almost as wide variations in yield were found within a variety as in different varieties. By means of several crosses between Lion, a smooth-awned black barley, and Manchuria, a smooth-awned barley of high yielding ability has been produced. Other promising crosses have also been obtained. Sixty-eight selections, crosses and new introductions are compared on the basis of the yearly production. A method for discarding in elimination tests based on the probable error is presented.—*W. E. Bryan.*

1519. Harper, R. A. **Inheritance of sugar and starch characters in corn.** Bull. Torrey Bot. Club 47: 137-186. *3 pl.* April, 1920.—Work of Correns and of East and others on the inheritance of sugar and starch characters in corn endosperm (*Zea*) is reviewed to show that intermediate sweet-starchy types result from crossing these two forms. Original experiments with crosses of different sweet and starchy endosperm varieties carried to the fourth filial generation are described and illustrated. Dominance of starchiness is shown in first cross but in segregating generations intermediate kernels ranging from practically pure sweet to pure starchy in appearance were obtained in varying proportions and degree along with other cases in which more definite segregation occurred. The different grades of kernels are classified and tabulated. Marked tendency shown for intermediate types to breed true but with more of an inclination to revert to sweet type than to starchy type. Practically pure starchy ears, in appearance, were obtained from a cross of two sweet varieties. Continuity of variation in both sexually and asexually reproduced types is taken as an indication of mutual modification of germplasm where contrasting characters are brought together. The main features of chromosome individuality and of reduction phenomena are considered as established but the physiological nature of the chromatin is thought to permit mixing of hereditary materials resulting in intergradations between parental forms.—*D. E. Jones.*

1520. HENDRICKSON, A. H. **Plum pollination.** California Agric. Exp. Sta. Bull. 310. *28 p., 5 fig.* July, 1919.—Experiments show 13 varieties self-sterile, 3 self-fertile and 1 doubtful. Early-blooming Japanese varieties produce little pollen and are not efficient pollenisers. Late-blooming varieties produce abundant pollen. Except for the self-fertile French and sugar prunes interplanting of varieties is recommended to increase yields. No evidence of intersterility among plum or prune varieties was found. Experiments show that bees are efficient agents of cross-pollination. Set of fruit is also influenced by climatic factors.—*J. L. Collins.*

1521. HERRE, ALBERT C. **Hints for lichen studies.** Bryologist 23: 26-27. 1920.—See Bot. Absts. 5, Entry 1919.

1522. HERTWIG, P. [German rev. of: BOVERI, THEODOR. **Zwei Fehlerquellen bei Merogonieversuchen und die Entwicklungsfähigkeit merogonischer und partiellmerogonischer Seeigelbastarde. (Two sources of error in investigations of merogony and the ability of merogonic and partially merogonic sea-urchin hybrids to develop.)** Arch. Entwicklungsmech. Organ. **44**: 417-471. *5 pl.* 1918.] Zeitschr. indukt. Abstamm. Vererb. **22**: 216-218. Mar., 1920.—See also Bot. Absts. 3, Entry 600.

1523. HERTWIG, P. [German rev. of: HERTWIG, GÜNTHER. **Kreuzungsversuche an Amphibien. (Hybridization studies on amphibians.)** Arch. Mikrosk. Anat. **91**: 203-271. *8 fig.* Aug. 20, 1918. See Bot. Absts. 3, Entry 1005. Zeitschr. indukt. Abstamm. Vererb. **22**: 219-221. Mar., 1920.

1524. HILGENDORF, F. W. **Methods of plant breeding.** New Zealand Jour. Agric. **19**: 354-358. 1919.—Popular. [See Bot. Absts. 5, Entry 1153.]

1525. HOLLÄNDER, EUGEN. **Familiäre Fingermissbildung (Brachydaktylie und Hyperphalangie). [Familial abnormalities of the fingers (brachydactyly and hyperphalangy).]** Berlin Klin. Wochenschr. **55**: 472-474. 1918.—A man and his son, and probably also his sister, are characterized by a shortening of the fingers accompanied by an extra bony element in the basal phalanx of digits two and three. Evidence is brought forth to show that the extra element is an ununited epiphysis, the inhibition of normal union being in these cases apparently an hereditary trait.—*C. H. Danforth.*

1526. HOLMBERG, O. R. **Carex dioica×paniculata, en för Skandinavien ny hybrid. [Carex dioica×paniculata, a hybrid new for Scandinavia.]** Bot. Notiser **1918**: 249-252. *3 fig.* 1918.

1527. HONING, J. A. **Selectie-proeven med Deli-tabak. II. [Selection experiments with Deli-tobacco. II.]** Meded. Deli-Proefstation, Medan, Sumatra, **2**: 84. *1 pl.* 1918.—Gives results of selection experiments at Deli Proefstation for 1917. The tobacco was harvested separately, tied in bundles with specially colored twine, fermented in bulk with the other tobacco, and finally separated for testing. In general the results of 1917 were inferior to those of 1916 due to less favorable weather. Both large- and small-scale trials were made. In the small-scale trials there were 467 lots, most of these containing 800-1200 plants. These repres ented 150 seed-numbers belonging to 81 lines. Of the large-scale trials, with from 90,000 to 560,000 plants per lot, there were 34. These trials were distributed over 17 estates and were supervised by 5 assistants. Figures for production, percentages of various qualities, estates' grading and manufacturers' grading, leaf measurements, numbers of leaves per plant, burning tests, etc., are given for most of these lines. The writer does not agree with KOCH (KOCH, L. Algem. 1528 Landbouwincekblad voor Med. India, Dec. 7, 1917) that mixed seed is to be preferred to that from pure lines, so far as tobacco culture is concerned. [See also next following Entry, 1528.]—*Carl D. La Rue.*

1528. HONING, J. A. **Selection experiments with Deli tobacco. III.** Meded. Deli-Proefstat. Medan **2**: 25. 1919.—See also next preceding Entry, 1527.

1529. Hottes, Alfred C. **Our American originators.** Florists' Exchange **48**: 933. *3 fig.* Dec. 27, 1919.—The work of the A. W. Livingston Seed Co., of Columbus, Ohio, is discussed somewhat flatteringly and information is given as to the source or point of origin of nineteen commercial varieties of potatoes.—*H. F. Roberts.*

1530. Houwink, R. Hzn. **Erfelijkheid. Populaire beschouwingen omtrent het tegenwoordige standpunt der erfelijkheid, versameld uit theorie en practijk. [Heredity. Popular presentation of the present status of heredity compiled from theory and practice.]** Assen, Stoomdrukkerij Floralia 1919: 1-62. *5 pl.* 1919.

1531. Howe, Lucien. **The relation of hereditary eye defects to genetics and eugenics.** Jour. Heredity **10**: 379-382. Nov., 1919.

1532. Hume, A. N. **Corn families of South Dakota.** South Dakota Agric. Exp. Sta. Bull. **186**: 114-134. Aug., 1919.—A plan of corn breeding is described in which a 96-ear-row breeding plot is employed. The plot is divided into four independent quarters of twenty-four rows each and alternate rows are detasseled in order to insure against the most extreme forms of inbreeding. Thus far the system follows that devised by the Illinois Agricultural Experiment Station. An important modification, however, lies in the fact that instead of planting the tasseled or "sire" rows from different individual ears, all of the twelve "sire" rows of each quarter are planted from kernels of a single ear. This not only permits a more intense selection for high yield but also makes possible the establishment of a definite ear pedigree along both lines of parentage. Data are given to show the tendency of yielding capacity of seed ears to follow lines of ancestry.—*L. H. Smith.*

1533. Hume, A. N. **Yields from two systems of corn breeding.** South Dakota Agric. Exp. Sta. Bull. **184**: 70-86. Jan., 1919.—Two systems of corn breeding are compared, both of which are based upon the ear-row plan of continuous selection. The essential difference between the two systems is that in the one, alternate rows of the breeding plot are detasseled and seed is taken only from detasseled plants thereby insuring a certain degree of crossing while in the other system this precaution is omitted. The results based upon several seasons' data indicate no significant difference in effectiveness in increasing yield. The working details of a plan of corn improvement intended to meet the demand for simplicity and practicability are appended.—*L. H. Smith.*

1534. Ikeno, S. **Études d'hérédité sur la réversion d'une race de Plantago major. [Hereditary studies on reversion in a race of Plantago major.]** Rev. Gén. Bot. **32**: 49-56. 1920.

1535. Ireland, Alleyne. **Democracy and heredity—A reply.** Jour. Heredity **10**: 360-367. Nov., 1919.

1536. Janssens, F. A. **À propos de la chiasmatype et de la théorie de Morgan. [Concerning the chiasmatype and Morgan's theory.]** Réunion Soc. Belge Biol. 1919: 917-920. 1919.

1537. Janssens, F. A. **Une formule simple exprimant de qui se passe en réalité lors de la "chiasmatypie" dans les deux cinèses de maturation. [A simple formula expressing what really takes place in chiasmatypy in the two maturation divisions.]** Réunion Soc. Belge Biol. 1919: 930-934. 1919.

1538. Johannsen, W. **Weismanns Keimplasma-Lehre. [Weismann's germplasm theory.]** Die Naturwiss. **6**: 121-126. 1918.

1539. Johannsen, W. **Om Weismann's Kimplasma-Laere. [Weismann's germplasm theory.]** Vidensk. Meddelelser fra Dansk Naturhist. Foren i Kjøbenhavn. **69**: 153-164. 1918.

1540. Johnson, Charles W. **Variation of the palm weevil.** Jour. Heredity **11**: 84. Feb., 1920.

1541. JOHNSON, JAMES. **An improved strain of Wisconsin tobacco. Connecticut Havana No. 38.** Jour. Heredity 10: 281–288. *Fig. 8–10.* June, 1919.

1542. JONES, D. F., AND W. O. FILLEY. **Teas' hybrid catalpa. An illustration of the greater vigor of hybrids; increased growth and hardiness as a result of crossing; illustrating definite principles of heredity.** Jour. Heredity 11: 16–24. *6 fig.* Jan., 1920.

1543. JONES, D. F. **Selection in self-fertilized lines as the basis for corn improvement.** Jour. Amer. Soc. Agron. 12: 77–100. 1920.—Selection in self fertilized lines makes possible a reliable estimation of hereditary values of both sexes and is suggested for corn improvement. —*F. M. Schertz.*

1544. KAPPERT, H. **Über das Vorkommen volkommener Dominanz bei einem quantitativen Merkmal.** [**The occurrence of complete dominance in a quantitative character.**] Zeitschr. indukt. Abstamm. Vererb. 22: 199–209. *1 fig.* Mar., 1920.

1545. KEMPTON, J. H. **Heritable characters of maize. III. Brachytic culms.** Jour. Heredity 11: 111–115. *4 fig.* Mar., 1920.

1546. KLATT, B. **Experimentelle Untersuchungen über die Beeinflussbarkeit der Erbanlagen durch den Körper.** [**Experimental investigations on the modifiability of the hereditary factors through the soma.**] Sitzungsber. Ges. Naturf. Freunde. 1919: 39–45. 1919.—Writer experimented with three races of gypsy moth (*Lymantria dispar*). The caterpillars of one of these had an unusually broad yellow stripe along the back, dominant on the whole over the narrow yellow stripe of the normal race. The third race had a black longitudinal stripe, dominant over yellow and normal and clearly differing by a unit factor. He extirpated the ovaries of individuals dominant in one or both factors (yellow or black) and transplanted in their place ovaries from recessive individuals. These females were mated with recessive males. The caterpillars appeared to be pure recessives, showing no trace of the dominant characters of the foster mothers. [See also Bot. Absts. 5, Entry 1579.]—*Sewall Wright.*

1547. KLATT, BERTHOLD. [German rev. of: DÜRKEN, BERNHARD. **Einführung in die Experimentalzoologie.** (**Introduction to experimental zoology.**) *16 x 23 cm., x + 446 p., 234 fig.* Julius Springer: Berlin, 1919.] Zeitschr. indukt. Abstamm. Vererb. 22: 275–276. May, 1920.

1548. KLATT, B. [German rev. of: (1) PALMGREN, ROLF. **Till Kännedomen om Abnormiteters Nedärfning hos en del Husdjur.** (**Inheritance of abnormalities in certain domestic animals.**) Acta Soc. pro fauna et flora fennica 44: 1–22. 1918. (2) PALMGREN, ROLF. **Tvenne bastarder mellan getbock och fartacka, födda i Högholmes zoologiska trädgard.** (**Two hybrids between sheep and goats produced in Högholm zoological gardens.**) Med. pro fauna et flora fennica 44: 124–125. 1918.] Zeitschr. indukt. Abstamm. Vererb. 22: 283–284. May, 1920.

1549. KLATT, B. [German rev. of: PÉZARD, M. A. **Transformation expérimentale des caractères sexuels secondaires chez les Gallinacés.** (**Experimental transformation of secondary sexual characters in Gallinaceae.**) Compt. Rend. Acad. Sci. Paris 160: 260–263. 1915.] Zeitschr. indukt. Abstamm. Vererb. 22: 284. May, 1920.

1550. KOCH, L. **Verdere Onderzoekingen betreffende de praktijkwaarde van de lijnenselectiemethode, mede in verband met het gemengd planten van varieteiten.** [**Further observations on the practical value of the line-selection method and a comparison of it with the mixed planting of varieties.**] Teysmannia 29: 389–423. 1918.—Author has made comparative tests of planting in (a) pure lines, (b) mixed populations and (c) populations made up of definite mixtures of pure lines of the following crops: rice, katjang tanah, kedelee, corn, potatoes, and cassave, and finds that in rice and katjang, line selection gives no satisfactory results. Varieties of rice when in mixed plantings influence each other greatly. The results of such

influences depend upon the kind and proportion of the varieties in the mixture. It is possible to get mixtures that produce a higher average yield than any of the varieties of which the mixture is composed. [See also next following Entry 1551.]—*W. H. Eyster.*

1551. Koch, L. ***Onderzoekingen betreffende de praktijkwaarde van de lijnenselectie-methode voor verschillende éénjarige landbouwgewassen.*** **[Researches concerning the practical value of the line selection method for various annual tropical crops.]** Teysmannia 29: 1-36, 96-127, 156-191, 389-423. 1918.—The line-breeding method was first practised in 1907 by van der Stok, then assistant at the botanical section of the Experiment Station for Rice and other Annual Crops at Buitenzorg, Java. A great deal of line breeding had been performed before 1915, the selected crops being specially rice, ground-nuts and soy beans. During the years when most breeding took place (1911–1915) some peculiarities were noticed, which gave birth to the idea that line breeding was by no means a method for securing high-producing rice strains, etc. In the trials (almost all of them with 8 or more control plots) it was observed that the population (mixture of all strains, high- and low-producing) gave in most cases an unexpectedly high yield, higher than most selected pure strains. Breeding did meet with success where immunity for certain diseases or qualitative peculiarities were aimed at. As most breeding was for increasing the yield, a series of trials was undertaken to determine whether line breeding should be continued or not, and to investigate the reason why there was so little success.—In the years 1914–1916 selection took place for 6 rice varieties. In only 2 of 16 trials did the selected rice strains give a fairly good yield in comparison to the unselected mixture. As a rule, a strain that gave one year the highest yield, failed to do so in the next. More than once such a strain yielded much less than some others had that been much inferior the previous year.—As the climate at Buitenzorg is somewhat peculiar, and results might perhaps be influenced by the great rainfall or the moist atmosphere, trials were made at the same time at the experimental farms at Ngandjoek and at Sidoardjo, these places being situated respectively in the central and the eastern part of Java. Out of six trials at Ngandjoek, the pure strains and the unselected mixture were alike; at Sidoardjo, in 2 out of 3 cases, the strains failed to give a higher yield than the population.—The supposition arose that the high yield of the population might be caused by the fact that the mixture is, generally speaking, more suited for uneven circumstances than is a pure variety.—In order to investigate this matter author began, in 1915, a series of trials wherein mixed-up pure strains were compared with the same races unmixed. The same was done by mixing up pure varieties. In most trials the varieties or strains were compared in this way: (1) variety A, 100 per cent; (2) variety B, 100 per cent; (3) A, 75 per cent + B 25 per cent; (4) A 50 per cent + B 50 per cent; (5) A 25 per cent + B 75 per cent.—Not only the yielding but also the stooling power was examined. When the paddy was ripe the ears were cut by hand and afterwards all the product in the trials where pure varieties had been mixed up was separated by hand so that one could know exactly which part of the yield had been provided by variety A, and what part by B. All heads were counted, so that the average weight was determined. The result of 4 trials with 8 controls showed that the pure strains and varieties did, on the whole, not so well as the mixtures. The stooling power shown by weekly counts, was in most cases higher than the pure strains; in one of the four cases, however, all the counts were remarkably lower with the mixtures than with the pure strains. Of two varieties, the highest producer (singly planted) did not always give the greatest proportion of the product of the mixture. In most cases the heads of the varieties that suppressed the other one became heavier and the heads of the suppressed one became lighter.—Trials of the same order were made with maize, soy beans and peanuts. With maize, yellow Menado corn and Saipan corn, singly planted, were compared with mixtures of these varieties. The mixtures yielded as much as 12 per cent more than the highest-producing variety separately planted. With soy beans the same was to be observed: 70 per cent of black mixed with 30 per cent of white soy beans yielded 12 per cent more than black alone, and 28 per cent more than white alone. With peanuts, 9 out of 10 mixtures gave a higher yield than might have been expected from the yield for the pure strains.—In the year 1916–1917, out of 4 trials comparing pure strains with mixtures of the same strains, no conclusions could be reached as to which should be preferred, strains or

mixtures.—Out of 5 other such trials made at Sidoardjo, only in one case did the strains yield more than the mixtures.—The same was done for peanuts, the strains producing a little more than the mixtures.—The conclusion could be reached that: (1) Mixed planting of rice or peanuts does not necessarily raise the production. (2) Line selection with paddy gives wholly unsatisfactory results.—In 15 other trials, made in 1916–1917, where mixed-up pure varieties of paddy had been compared (8 controls) with the same varieties unmixed, the following conclusions were reached: (1) The yield of a mixture of pure varieties is, on the whole, higher than the calculated yield based on the production of the varieties planted singly. (2) The stooling power in a mixture is generally higher than the calculated.—(3) The percentage of stalks bearing heads is somewhat less in mixtures than in pure varieties. (4) The mean head-weight of different varieties in a mixture exhibits greater variation, and may differ greatly from the weight of the same variety not mixed. (5) In a mixture one variety may suppress another. (6) The suppressing variety is not necessarily the highest yielding when planted singly. (7) The suppressing variety is generally the race that stools most, when other characters are the same. (8) As a rule, the mean weight of the head increases with the suppressing variety and decreases with the suppressed one. (9) Perhaps it may be possible to find empirically mixtures that are well suited to certain circumstances.—Mixing trials have also been made with sweet potatoes (14 trials) and cassava varieties (1 trial). With sweet potatoes no conclusions could be made as to the yielding power; with cassava the mixture proved to be better than the best pure race. [See also next preceding Entry, 1550.]—*L. Koch.*

1552. KOHLBRUGGE, J. H. F. **De erfelijkheid van verkregen eigenshappen. [Inheritance of acquired characters.]** Genetica 1: 347–386. 1919.

1553. KRAFKA, JOSEPH, JR. **The effect of temperature upon facet number in the bar-eyed mutant of Drosophila. Part I.** Jour. Gen. Physiol. 2: 409–432. *10 fig.* Mar. 20, 1920. **Part II.** *Ibid.*, 433–444. *4 fig.* May 20, 1920. **Part III.** *Ibid.*, 445–464. May 20, 1920.—Breeding experiments with the bar-eyed mutant of *Drosophila melanogaster* at constant temperatures between 15°–31°C. have shown that the mean facet number varies inversely with the temperature at which the larvae develop, though no such variation occurs in the normal wild stock. The temperature coefficient for the variation in facet number of bar eye is of the same order as that for chemical reactions, and the variation may be plotted as an exponential curve. The greatest percentages of increase per degree centigrade come at the upper and lower temperatures. The temperature curve for rate of development of the immature stages of the fly corresponds with the facet curve from 15°–27°C., but drops above that point. The rate of development may be interpreted as the resultant of a number of different processes having different temperature coefficients. Temperature is effective in determining facet number during a relatively short period in larval development only, i.e., at a stage when about 36 per cent of immature development is completed. This period is about 18 hours long, and the temperature either before or after that time has no effect on facet number. The time at which this period is reached is dependent on the rate of development, but the facet number is not influenced by the length of the immature stage. The correlation between the two curves is therefore only apparent. It is suggested that the decrease in facet number in the bar-eyed flies may be accounted for by the presence of an inhibitor in the mutant stock, the temperature coefficient of which differs from that of the normal facet-producing reaction.—It is shown also that the coefficient of variability of the facet number in bar-eyed flies increases with temperature, while the standard deviation apparently decreases. The effect of temperature on facet number in bar-eyed stock is not inherited.—*H. H. Plough.*

1554. KUIPER, K. **Onderzoekingen over kleur en teekening bij runderen. Naar experimenten van R. Houwink Hzn. [Studies on color and color pattern in cattle. Based on experiments of R. Houwink Hzn.]** Genetica 2: 137–161. *5 pl.* Mar., 1920.

1555. KÜSTER, E. **Über mosaikpanaschierung und vergleichbare Erscheinungen. [Mosaic variegation and comparable phenomena.]** Ber. Deutsch. Bot. Ges. 36: 54–61. 1918.

1556. Küster, E. **Über sektoriale Panaschierung und andere Formen der sektorialen Differenzierung. [On sectorial variegation and other forms of sectorial differentiation.]** Monatshefte f. d. natw. Unterr. 12: 84–87. 1919.

1557. Lebedinsky, N. G. **Darwins geschlechtliche Zuchtwahl und ihre arterhaltende Bedeutung. [Darwin's sexual selection and its significance for the maintenance of species.]** Habilitationsvortrag. *31 p.* 1918.—See Bot. Absts. 5, Entry 1423.

1558. Lehmann, Ernst. **Zur Terminologie und Begriffsbildung in der Vererbungslehre. [Terminology and formation of genetical concepts.]** Zeitschr. indukt. Abstamm. Vererb. 22: 236 *260*. May, 1920.

1559. Lehmann, E. [German rev. of: (1) Sperlich, Adolf. **Die Fähigkeit der Linienerhaltung (phyletische Potenz), ein auf die Nachkommenschaft von Saisonpflanzen mit festen Rhythmus ungleichmässig übergehender Faktor. (Capacity to maintain lines (phyletic potency) a factor distributed irregularly to the offspring of plants with fixed seasonal rhythm.)** Sitzungsber. Akad. Wiss. Wien 128: 379. 1919. (2) Sperlich, Adolf. **Über den Einfluss des Quellungszeitpunktes von Treibmitteln und des Lichtes auf die Samenkeimung von Alectorolophus hirsutus All. Charakterisierung der Samenruhe. (On the influence of the time of application of forcing-agents and of light on the germination of seeds of Alectorolophus hirsutus. Characterization of seed rest.)** Sitzungsber. Akad. Wiss. Wien 128: 477. 1919.] Zeitschr. indukt. Abstamm. Vererb. 22: 299–301. May, 1920.

1560. Leighty, Clyde E. **Natural wheat-rye hybrids of 1918.** Jour. Heredity 11: 129–136. *4 fig.* Mar., 1920.

1561. Levine, C. O. **The water buffalo—A tropical source of butter fat.** Jour. Heredity 11: 51–64. *9 fig.* Feb., 1920.

1562. Levine, C. O. **Swine, sheep, and goats in the orient.** Jour. Heredity 11: 117–124. *6 fig.* Mar., 1920.

1563. Lewis, A. C. **Annual report of the State Entomologist for 1918.** Georgia State Bd. Ent. Bull. 55: 1–31. *Fig. 2.* 1919.—The cotton breeding work is along three main lines: to improve the wilt resistant varieties which have already been developed, breeding for earliness in Sea Island cotton, and to improve the varieties of cotton which are especially adapted to central and north Georgia. Breeding for wilt resistance is being done with three varieties, Lewis 63, Council Toole and DeSoto, all of which now give satisfactory results under wilt conditions. Efforts are being made to stabilize the length of lint in the hybrid Dix-Afifi, a long staple upland wilt-resistant variety. Selections are being made to improve ten varieties of cotton adapted to north and central Georgia. A strain of Sea Island cotton known as No. 33 has been developed which is much earlier than the ordinary varieties. This strain is also very prolific and produces a small stalk.—*D. C. Warren.*

1564. Lienhart. **De la possibilité pour les eleveurs d'obtenir a volonté des males ou des femelles dans les races gallines. [On the possibility for the raiser to obtain males or females at will in the races of poultry.]** Compt. Rend. Acad. Sci. Paris 169: 102–104. 1919.

1565. Lindhard, E., and Karsten Iversen. **Vererbung von roten und gelben Farbenmerkmalen bei Beta-Rüben. [Inheritance of red and yellow color characters in beets.]** Zeitschr. Pflanzenzücht. 7: 1–18. June, 1919.—Crosses were made between red, yellow and white types of beets (*Beta*) and carried through the F_4 generation in some cases. A provisional factorial hypothesis is presented in which $R\ G$ denotes red; $r\ G$, yellow; and $R\ g$ and $r\ g$ white. This presupposes a 9:3:4 ratio when a plant R_rGg is self-pollinated. A large F_2 generation approximates such a ratio rather poorly and the author suggests a linkage between R and G with a gametic ratio of 1.8:1 which fits the F_2 results closely. This linkage relation, however,

does not apparently hold in the only two back-crosses listed, although the total number of individuals is slightly less than 400. The author then suggests the presence of a lethal factor (*T*) but does not develop this idea.—*E. W. Lindstrom.*

1566. LIPSCHÜTZ, A. **Bemerkung zur Arbeit von Knud Sand über experimentellen Hermaphroditismus. [Comments on the work of Knud Sand on experimental hermaphroditism.]** Pflüger's Arch. 176: 112. 1919.

1567. LITTLE, C. C. **A note on the origin of piebald spotting in dogs.** Jour. Heredity 11: 12–15. *1 fig.* Jan., 1920.

1568. LITTLE, C. C. **Is there linkage between the genes for yellow and for black in mice.** Amer. Nat. 54: 267–270. May–June, 1920.—Discussion of recent paper of DUNN's referring to a deficiency of black young in a family of yellow mice. Because of small number of offspring involved, it is pointed out that the deviation from normal expectation may be entirely a matter of chance. DUNN states that yellow and black may possibly be linked. Author calls attention to the fact that yellow and agouti are allelomorphic and that agouti has been shown not to be linked to black. Author gives alternative explanation for observed facts, viz., assumption is made that a lethal factor is linked to black in the family above noted, and that this lethal is effective in a heterozygous condition in non-yellow mice but not in yellow mice. —*H. L. Ibsen.*

1569. LITTLE, C. C. **The heredity of susceptibility to a transplantable sarcoma (J. W. B.) of the Japanese waltzing mouse.** Science 51: 467–468. May 7, 1920.—In a cross between a Japanese waltzing mouse one hundred per cent susceptible to a transplantable sarcoma (J. W. B.) and the common non-waltzing mouse not susceptible to the sarcoma, the F_1 generation hybrids were all susceptible to the sarcoma, but the F_2 hybrids gave a total of twenty-three susceptible to sixty-six non-susceptible animals thus supporting the expectations on the three-, four-, five-, and seven-factor hypotheses.—To determine more closely the number of factors involved F_2 hybrid mice,—themselves susceptible,—were crossed back with the non-susceptible parent race. The numbers obtained were twenty-one susceptible to 208 non-susceptible which indicates that from three to five factors—probably four— are involved in determining susceptibility to the mouse sarcoma (J. W. B.).—Simultaneous presence of these factors is considered necessary for susceptibility. None of these factors is carried in the sex (X) chromosome since all the "X" chromosomes in the resulting animals, of the back-cross, if the original mating is a non-susceptible female with a susceptible male, will be derived from the common non-susceptible mice.—*Mary B. Stark.*

1570. LO PRIORE, G. **Sulla ereditarietà della fasciazione nelle spighe del mais. [On the inheritance of a fasciation in the maize ear.]** Staz. Sper. Agr. Ital. 51: 415–430. 1918.—Four fasciated ears of maize were found in 1902. A progeny of these, grown from open-pollinated seed, produced fasciated ears on one-third of the plants. The second year 40 per cent of the plants bore fasciated ears, while in the third year the progeny of a better-fasciated ear produced such ears on 60 per cent of the plants. The plants with fasciated ears showed no other abnormalities and yielded exceptionally well. The author concludes that a fasciated race of maize can be developed by selection although the abnormal form is transmitted to only a part of the offspring and according to laws of heredity not yet formulated.—The relation of traumatic and chemical treatment to the development of fasciations and other abnormalities as well as the relation of fasciation to the origin of the normal maize ear is discussed.—*J. H. Kempton.*

1571. LOSCH, HERMANN. **Ascidienbildung an Staubfäden vergrünter Blüten von Tropaeolum majus. [Ascidia formation on stamens of virescent flowers of Tropaeolum majus.]** Ber. Deutsch. Bot. Ges. 37: 369–372. Dec., 1919.—Describes on virescent stamens of *Tropaeolum majus* ascidia in various stages of development. Inner side of ascidium is foliar under side.—*James P. Kelly.*

1572. Lotsy, J. P. **Heribert Nilsson's onderzoekingen over soortsvorming bij Salix met opmerkingen mijnerzijds omtrent de daarin en in publicaties van anderen uitgeoefende kritiek aan mijn soorts-definitie.** [Heribert-Nilsson's investigation on species formation in Salix with remarks of my own on the author's critique, and that of others on my taxonomic definitions.] Genetica 2: 162–188. Mar., 1920.

1573. Lotsy, J. P. **Cucurbita-Strijdpagen. De soort-quaestie.—Het gedrag na kruising.—Parthenogenese? II. Eigen onderzoekingen.** [Cucurbita problems. The species question. The result of crossing. Parthenogenesis? II. Investigations by the author.] Genetica 2: 1–21. *1 3-colored plate, 9 fig.* Jan., 1920.

1574. Lühning. **Die erbliche Geschlechtsverknüpfung.** [Hereditary sex linkage.] Deutsch. Landw. Tierzucht. 22: 77–78. 1918.

1575. Malinowski, Edmund. **Die Sterilität der Bastarde im Lichte des Mendelismus.** [The sterility of hybrids in the light of Mendelism.] Zeitschr. indukt. Abstamm. Vererb. 22: 225–235. May, 1920.

1576. Mass, J. G. J. A. **Field experiments with Hevea.** Agric. Bull. Federated Malay States 6: 561–613. 596–597. 1918.

1577. Masui, Kiyoshi. **The spermatogenesis of domestic mammals. I. The spermatogenesis of the horse (Equus caballus).** Jour. Coll. Agric. Imperial Univ. Tokyo 3: 357–376. *3 pl., 3 fig.* 1919.

1578. Masui, Kiyoshi. **The spermatogenesis of domestic mammals. II. The spermatogenesis of cattle (Bos taurus).** Jour. Coll. Agric. Imperial Univ. Tokyo 3: 377–403. *3 pl., 1 fig.* 1919.

1579. Matthaei, R. [German rev. of: Klatt, B. **Experimentelle Untersuchungen über die Beeinflussbarkeit der Erbanlagen durch den Körper.** (Experimental investigations on the modifiability of the hereditary factors through the soma.) Sitzungsber. Ges. Naturf. Freunde 1919: 39–45. 1919. See Bot. Absts. 5, Entry 1546.] Zeitschr. Allg. Physiol. 18: 46–47. 1920.

1580. McAlpine, D. **Immunity and inheritance in plants.** Advisory Council Sci. Indust. Australia Bull. 7: 76–86. 1918.—A general discussion of the inheritance of disease resistance in wheat. Author recommends crossing susceptible varieties with resistant ones as means of developing rust immunity.—*J. H. Kempton.*

1581. Mendel, Kurt. **Familiäre peripherische Radialislähmung.** [Familial peripheral paralysis of the radial nerve.] Neurol. Centralbl. 39: 58–59. 1920.—It is recognized that heredity often plays a rôle in cases of facial paralysis, but it has not been determined whether the manifestation in these cases is due to the indirect effect of some hereditary anatomical anomaly, such for example as an unusually acute bend in the facial canal, or to a heightened susceptibility inherent in the nerve itself. The author now reports a family in which the father and two sons suffered from paralysis of the hand following very trivial injuries to the radial nerve at the elbow or near the shoulder. From these cases the author is led to believe that in hereditary paralysis involving the radial, probably the facial, and possibly other peripheral nerves, the underlying factor is to be sought not in any gross anatomical variation of the related parts, but in an hereditary condition of increased vulnerability of the particular nerve involved in the paralysis.—*C. H. Danforth.*

1582. Metz, Chas. W. **Correspondence between chromosome number and linkage groups in Drosophila virilis.** Science 51: 417–418. April 23, 1920.—Whereas in *Drosophila melanogaster* there are three large pairs and one very small pair of chromosomes, and three large groups and one very small group of linked genes, there are in *D. virilis* five large pairs, and one

very small pair of chromosomes, and five known groups of linked genes. Author points out that only twenty-seven mutant characters, of which fourteen are sex-linked, have thus far been investigated in this species, and that the failure to detect the sixth (and presumably small) group, is not surprising in view of the small number of characters investigated. He promises full data on this case in a future publication.—*John S. Dexter.*

1583. MITSCHERLICH, EILH. ALFRED. **Über künstliche Wunderährenbildung. [The artificial production of abnormal heads of cereals.]** Zeitschr. Pflanzenzücht. 7: 101–109. *8 fig.* Dec., 1919.

1584. MOHR, OTTO L., AND CHR. WRIEDT. **A new type of hereditary brachyphalangy in man.** Carnegie Inst. Washington Publ. No. 295. *64 p., 7 pl., 4 fig.* 1919.—A careful study based on personal examinations, authentic records, photographs and X-ray plates has been made of the hands of nearly 100 members of a Norwegian family in which an unusually clear-cut type of brachyphalangy occurs in at least six generations. The trait behaves as a simple dominant and is not sex-linked. In heterozygous individuals the manifestation is confined exclusively, so far as can be determined, to the middle phalanx of the index finger (and the comparable phalanx of the corresponding toe). The affected phalanx may be shortened to a moderate degree or reduced almost to the point of elimination in which case it is sometimes subluxated toward the ulnar side causing the terminal phalanx to bend radial-ward giving a "crooked" finger which is not (in this family) genetically different from a "short" finger. Of especial interest is the fact that the manifestations of the trait do not fluctuate around a single mode but arrange themselves in two distinct groups without any overlapping. The authors, therefore, postulate a second, modifying, gene which intensifies the effect of the main gene. This modifier is one of presumably many such genes which may be widely distributed in the human germ plasm without often having an opportunity to manifest themselves. Certain individuals who have married into the family have been heterozygous for the modifier, others have lacked it altogether. Failure to recognize the existence of this gene might easily have led to erroneous conclusion as to "dilution" of the main gene. In reality no dilution has taken place in the course of six generations. Of possibly great importance is the result of the marriage of two affected individuals. A single marriage of this sort yielded three children, one of whom lacked all fingers and toes and died at the age of a year. The authors are inclined to regard this case as the one instance of an individual homozygous for brachyphalangy and to look upon the gene as one which, when heterozygous, produces relatively inconsequential effects, but which when homozygous produces very serious, perhaps lethal, results.—*C. H. Danforth.*

1585. MOHR, OTTO L. **Mikroskopische Untersuchungen zu Experimenten über den Einfluss der Radiumstrahlen und der Kältewirkung auf die Chromatinreifung und das Heterochromosom bei Decticus verruccivorus (♂). [Microscopic studies in experiments on the influence of radium rays and effect of cold on the maturation and the heterochromosome of Decticus verruccivorus (♂).]** Arch. mikrosk. Anat. 92: 300–368. *6 pl.* 1919.

1586. MORGAN, T. H. **Variations in the secondary sexual characters of the fiddler crab.** Amer. Nat. 54: 220–246. *6 fig.* May–June, 1920.—Two variations are described that are shown not to be due to regeneration. Whether due to genetic change, to infection, or to some embryonic "slip" could not be determined. Literature relating to sex-intergrades in crustacea is reviewed.—*T. H. Morgan.*

1587. MOTTET, S. **Digitalie hybride de Lutz. [The Lutz Digitalis hybrid.]** Rev. Hortic. 91: 396–397. 1919.—See Bot. Absts. 5, Entry 1827.

1588. MUMFORD, H. W. **Famous Angus cows of Scotland.** Breeder's Gaz. 76: 462–463. 1919.—Author discusses briefly the records of the foundation cows of certain famous families of the Aberdeen Angus breed.—*Sewall Wright.*

1589. Munns, E. N. **Effect of fertilization on the seed of Jeffrey Pine.** Plant World 22: 138–144. 1919.—Author reports on results of various cross- and self- pollinations among 8 trees of *Pinus Jeffreyi*, three of which were thrifty, two mistletoe-infected, one insect infected, and two "suppressed trees." On basis of observations author recommends that seed should be collected from localities with strong winds at time of flowering so that cross-pollinated seeds may be secured; and that for heavy seeds and consequent stronger seedlings collections should be from thrifty parents; poor trees gave largest number of seeds to pound but produced smallest nursery trees; and that in timber-sale practice only thrifty trees should be left. [See also Bot. Absts. 5, Entry 1375.]—*James P. Kelly.*

1590. Myers, C. H. **The use of a selection coefficient.** Jour. Amer. Soc. Agron. 12: 106–112. 1920.—$\frac{\text{Number of ripe ears}}{\text{Total number of ears}}$ = percentage of maturity. The average yield per stalk of maize was determined in pounds. It was desirable to combine the yield and the maturity into a single expression which would serve as a basis for selection. The average yield per stalk times the percentage of maturity gives the "selection coefficient."—*F. M. Schertz.*

1591. Nachtsheim, Hans. **Crossing-over-Theorie oder Reduplikationshypothese? [The crossover theory or the reduplication hypothesis?]** Zeitschr. indukt. Abstamm. Vererb. 22: 127–141. *4 fig.* Jan., 1920.

1592. Nachtsheim, Hans. **Zytologische und experimentelle Untersuchungen über die Geschlechtsbestimmung bei Dinophilus apatris Korsch. [Cytological and experimental studies on the sex determination of Dinophilus apatris Korsch.]** Arch. Mikrosk. Anat. 93: 17–140. *4 pl., 5 fig.* Nov., 1919.

1593. Naef, A. **Idealistische Morphologie und Phylogenetik. (Zur Methodik der systematischen Morphologie.) [Idealistic morphology and phylogeny. (On the method of systematic morphology.)]** *77 p., 4 fig.* Jena, 1919.

1594. Noack, Konrad. [German rev. of: Stomps, Theo. J. **Gigas-mutation mit und ohne Verdoppelung der Chromosomenzahl. [Gigas-mutation with and without doubling of the chromosome number.** Zeitschr. indukt. Abstamm. Vererb. 21: 65–90. *3 pl., 4 fig.* July, 1919. (See Bot. Absts. 4, Entry 778.)] Zeitschr. Bot. 12: 36–39. 1920.

1595. Noyes, Hilda H. **The development of useful citizenship.** Jour. Heredity 11: 88–91. Feb., 1920.

1596. Nuttall, G. H. F. **The biology of Pediculus humanus.** Parasitology 2: 201–220. *1 pl., 1 fig.* 1919.—Lice reared on white backgrounds developed very little pigment and appeared whitish or translucent but those reared on black backgrounds became very darkly pigmented thus showing that pigmentation is not inherited. In some lots taken from their host as high as 9 per cent of the adult individuals were hermaphrodites.—*D. D. Whitney.*

1597. O., A. **Zonal Pelargoniums.** Gard. Chron. 66: 157. Sept. 20, 1919.—Maxime Kavolsky, a comparatively new variety is briefly described.—*A. C. Hildreth.*

1598. Palmgren, Rolf. **Till Kännedomen om Abnormiteters Nedärfning hos en del Husdjur. [Inheritance of abnormalities in certain domestic animals.]** Acta Soc. pro fauna et flora fennica 44: 1–22. 1918.—See Bot. Absts. 5, Entry 1548.

1599. Palmgren, Rolf. **Tvenne bastarder mellan getbock och fartacka, födda i Högholmes zoologiska trädgard. [Two hybrids between sheep and goats produced in Högholm zoological gardens.]** Med. pro fauna et flora fennica 44: 124–125. 1918.—See Bot. Absts. 5. Entry 1548.

1600. Pammel, L. H., and C. M. King. **An annual white sweet clover.** Proc. Iowa Acad. Sci. 25: 249–251. *Pl. 4–6.* 1920.—See Bot. Absts. 5, Entry 1191.

1601. PAMMEL, L. H., AND C. M. KING. **A variation in the black walnut.** Proc. Iowa Acad. Sci. 25: 241–248. *Pl. 3, fig. 43–44.* 1920.

1602. PATTERSON, J. T. **Polyembryony and sex.** Jour. Heredity 10: 344–352. *8 fig.* Nov., 1919.

1603. PELLEW, CAROLINE. **The genetics of Campanula carpatica.** Gard. Chron. 66: 238. *3 fig.* Nov. 8, 1919.—A brief consideration of investigations of the author more completely discussed in "Types of segregation," Jour. Genetics 6: 1917.—In *Campanula carpatica* hermaphrodites occur with male and female organs fully developed. In other plants the anthers fail to develop beyond a rudimentary stage while in others, still, development of the anthers is partial. Self-sterility is general in this species. In certain strains of *C. carpatica pelviformis* crosses between hermaphrodites or between females and hermaphrodites invariably gave mixed families consisting both of females and hermaphrodites, often with a preponderance of females. The hermaphrodites appear to produce more gametes carrying the female character than gametes carrying the hermaphrodite character. There is no consistent difference in this respect between the ovules and pollen of a single plant. In other strains the pollen and ovules differ. Two hermaphrodites were found, pollen of which, when used on females, gave rise exclusively to females, whereas ovules of the same plant fertilized by other hermaphrodites gave rise exclusively to hermaphrodites. A flower-color factor pair in this species also follows this unusual type of segregation by which the ovules and pollen are differentiated. Normal segregation of the color factor occurs on the female side resulting in equal numbers of ovules bearing blue or white allelomorphs. Ninety-seven per cent of the pollen grains, however, carry the white allelomorph and three per cent only the blue allelomorph.—Power of transmitting this unusual mode of segregation from parent to offspring is apparently limited to the ovules, for no plant similar to *C. carpatica pelviformis* has been derived from its male side. This type of segregation may be compared with the double-throwing variety of stock.—*C. B. Hutchison.*

1604. PÉZARD, A. **Castration alimentaire chez les coqs soumis au régime carné exclusif. [Alimentary castration in a cock subjected to an exclusive meat diet.]** Compt. Rend. Acad. Sci. Paris 169: 1177–1179. 1919.

1605. PITT, FRANCES. **Notes on the inheritance of color and markings in pedigree Hereford cattle.** Jour. Genetics 9: 281–302. *4 pl.* Feb., 1920.—Notes and photographs on which this paper is based come chiefly from the breeding of pure bred Herefords owned by W. J. PITT.—Excessive white on the sides of the belly and down the spine behaved to well marked animals as a recessive factor. The ratios were: heterozygote to heterozygote, 25 well marked: 10 excessive white; heterozygote to pure dominant well marked, 52 well marked; heterozygote to recessive excessive white, 7 well marked to 9 excessive white.—Dark neck or extension of the pigment area to include the neck, the crest, and to encroach on the white area on the tail behaved nearly as a dominant to the desired white markings. In the presence of the factor for excessive white the "dark-necked" factor apparently may be inhibited in its action.—A ring of red around the eyes is dependent on a single dominant factor. The ratios for heterozygote × heterozygote were 42 red-eyed to 12 white-eyed. The mating of the heterozygote × the recessive white-eyed gave 12 heterozygote to 15 complete recessive. It appears that the factor for red pigment around the eyes is independent of the other factors.—Pigment on the nose behaves as a dominant to clean nose, pigmented × non-pigmented giving 4 pigmented in F_1; pigmented heterozygous × non-pigmented, giving 3 pigmented to 3 not pigmented in the F_2.—Two pigment factors control coat color. Pale brown coat is dominant over the deep rich purple or claret coat. The factors for coat color apparently behave independently of the rest save with the possible exception of the pigmented nose.—The observation is made that the "claret"-coated animals may not feed as rapidly as the pale brown.—The history of the breed is cited to show that the factors discussed were present in early times.—*John W. Gowen.*

1606. Pleijel, C. **Valeriana excelsa Poir × officinalis L. nova hybrida.** [**Valeriana excelsa Poir × officinalis L. a new hybrid.**] Bot. Notiser 1918: 295-296. 1918.

1607. Popenoe, Paul. **Inbreeding and outbreeding.** [Rev. of: East, E. M., and D. F. Jones. **Inbreeding and outbreeding.** *14 x 21 cm., 285 p., 46 fig.* J. B. Lippincott: Philadelphia, 1919. (See Bot. Abstr. 4, Entry 571; 5, Entries 437, 1695.)] Jour. Heredity 11: 125-128. Mar., 1920.

1608. Popenoe, Paul. **World-power and evolution.** Jour. Heredity 11: 137-144. Mar., 1920.

1609. P[openoe], P. **Lock's last work.** [Rev. of: Lock, R. H. **Recent progress in the study of variation, heredity, and evolution.** *4th ed., 536 p.* E. P. Dutton & Co.: New York, 1916.] Jour. Heredity 11: 110. Mar., 1920.

1610. P[openoe], Paul. **Morgan on heredity.** [Rev. of: Morgan, Thomas Hunt. **The physical basis of heredity.** *14 x 21 cm., 300 p., 117 fig.* J. B. Lippincott Co.: Philadelphia, 1919.] Jour. Heredity 11: 144. Mar., 1920.

1611. P[openoe], P. [Rev. of: Punnett, Reginald Crundall. **Mendelism.** *5th ed., 15 x 19 cm., 219 p., 7 pl., 58 fig.* Macmillan & Co.: London, 1919.] Jour. Heredity 11: 115. Mar., 1920.

1612. Pridham, J. T. **Oat and barley breeding, agricultural research in Australia.** Advisory Council Sci. and Ind. Commonwealth of Australia, Bull. 7: 22-38. 1918.—Cross was made between the Algerian variety of oats and Carter's Royal Cluster. The F_2 consisted of 1,092 plants. There was great diversity among the young plants, some having coarse, broad leaves, while others had leaves almost like rye-grass in their fineness. There was also great diversity in character of stooling, foliage color, and habit of growth (erect or prostrate). On approaching maturity some plants showed pink or reddish color at base of stalk, a characteristic of the Algerian parent. 32.48 per cent of the plants exhibited the reddish straw, a percentage considered by the author to conform with a Mendelian ratio. The grain was of varying shades of brown, except in a few plants which produced yellow seeds, but no plants were found with white seeds like those of the male parent.—Four crosses were made between varieties of the Algerian type and those of the tree "class" and one cross was made between Algerian and a "side" oat. The F_1 plants were intermediate in character and of pronounced vigor. In subsequent generations from oat crossbreds of the "tree" or branching type, no individuals of the "side" type were found.—Attempts were made to cross *Avena fatua* with the Algerian variety and also with Chinese skinless, but without success.—A cross was effected between a "false wild oat" resembling *A. fatua* and white Bonanza. The progeny had slender straw, pale foliage and the open thin head with drooping branches of the wild oat. The line was not pursued further as no individuals of promise were found.—The most successful cross from the standpoint of the production of new varieties is white Ligowo × Algerian. From this cross sprang "Guyra," "Lachlan," and other strains of merit which have not yet been named. It is stated that the most productive varieties are those with stout awns and the value of skinless varieties is deprecated.—Seeds of various oat varieties and crossbreds were taken from Cowra and planted at Longerenong College, Victoria. In selections of these grown again at Longerenong striking variations were found in the Algerian oats. Among these were several plants with very coarse awns, very tall straw, white, large grain, and a limited number of stalks. These plants ripened unusually early. The possibility of the seed having been mixed was considered but no plants resembling these were found in other plots. This variation with a few individual exceptions bred true in succeeding years and was named "Sunrise" on account of its earliness.—A remarkable plant was found in Chinese skinless oats at Cowra in 1913. In addition to being much earlier than the other plants the early stools bore heads on which the upper flowers were like the skinless oat (three to five flowers to a spikelet) while the lower flowers resembled Algerian (two flowers to a spikelet

with stiff glumes). The early stools had a darker foliage than the late ones, which latter bore flowers typical of the skinless oat. The straw, when mature, was reddish like that of Algerian. Some of the seeds were naked and some were black or dark brown hulled. Progenies of individual plants have been grown for several seasons and continue to be quite variable, some having wholly naked, some half and half and some yielding only hulled seed. The hulled seed germinated best and also yielded best. Crosses between this oat and Dun and Ruakura have given no promising material.—An oat resembling *A. fatua* was found in a progeny of the natural crossbred of the Sunrise variation. In this progeny most of the plants resembled Sunrise and seed from such plants bred true, but the wild oat type split up remarkably. The plants varied in seed color, degree of awn, stoutness of straw and hairiness of grain, some being thickly felted while others were smooth. Since none of these types were of economic importance they were not persevered with.—Author states that well-marked variations which bred true have been found in the Kelsall's, Black Bell, Ruakura, and Winter Turf varieties. The characteristics of several varieties are given and the technique of oat crossing described.—Under the heading of Barley Breeding the author records having found a few plants of wild barley *Hordeum spontaneum* in a sample of wild wheat *Triticum dicoccum dicoccoides*. The wild barley was crossed with the Standwell and Kinver varieties. The F_1 crossbreds were more vigorous than the cultivated parents. They were uniformly of the Chevalier type and scattered easily. Plants in which the grain adhered more or less firmly to the rachis and resembled malting barley were selected. In the F_2 these selections compared favorably in productiveness with Kinver, Standwell and a two-row selection from Chilian. The straw is stronger, the awns stouter, the grain larger and the plants more drought-resistant than the ordinary malting barleys.—Author's assistant crossed a two-row naked-awned barley with ordinary skinless, also Kinver malting barley with the two-row and naked type. Among other variations the latter cross gave rise to a six-rowed bearded type.—Author states that a MR. PEACOCK of the Bathhurst Experiment Farm found a natural crossbred in the Standwell barley which gave rise to a two-rowed awnless, six-rowed awnless and a six-rowed awned, all of which bred true.—*J. H. Kempton.*

1613. PRZIBRAM, HANS. **Ursachen tierischer Farbkleidung.** [Causes of animal coat colors.] Arch. Entwicklungsmech. Organ. 45: 199–259. 1919.

1614. PUNNETT, R. C. **The genetics of the Dutch rabbit.—A criticism.** Jour. Genetics 9: 303–317. *1 pl., 2 fig.* Mar., 1920.—Author recognizes three true-breeding grades with reduced pigmentation and frequent heterochromia iridis, viz., White Dutch, Spotted Dutch, and Typical Dutch. Self-color is *PPTTSS* and White Dutch is *pptiss*. *S* raises White Dutch to Spotted Dutch and if *T* is also added pigmentation is increased to Typical Dutch. *P* produces darker types and eliminates heterochromia. The various combinations of these factors are fitted to Castle's data and this multiple factor theory is considered to agree better than Castle's hypothesis of multiple allelomorphism of the four types, Self-color, Dark Dutch, "Tan" Dutch, and White Dutch, and to make unnecessary his conception of "mutual modification."—*P. W. Whiting.*

1615. PYE, H. **Wheat breeding in its incidence to production. Agricultural research in Australia.** Advis. Council. Sci. and Ind. Commonwealth of Australia Bull. 7: 10–22. 1918. —General discussion of the application of breeding to improvement of wheat. Author records having noticed in the past few years many more natural crosses in wheat than heretofore. This increase in crossing is attributed to lack of pollen, some varieties having been lost through a failure to fertilize the ovules. An emasculated bearded wheat left to wind or insect pollination produced nine seeds, eight of which germinated, six producing bald ears and two bearded. Author lists four features which influence prolificacy and thirteen qualities which are associated with prolificacy in its relation to inherency and economical harvesting.—*J. H. Kempton.*

1616. R. [German rev. of: TROW, A. H. **On "albinism" in Senecio vulgaris L.** Jour. Genetics 6: 65–74. 1916. (See Bot. Absts. 1, Entry 947.)] Zeitschr. Pflanzenzücht. 7: 141. Dec., 1919.

1617. REIGHARD, JACOB. **The breeding behavior of the suckers and minnows. I. The suckers.** Biol. Bull. 38: 1-32. Jan., 1920.—The white sucker (*Catostomus commersonii*), the red-horse (*Moxostoma aureolum*), and the hogsucker (*Catostomus nigricans*) breed in the swift water of small streams on gravel bottom. In all, the breeding males bear pearl organs, and in the hogsucker the female also bears them. In spawning, those surfaces of the male that are rendered rough by the pearl organs are brought into contact with the female, and aid the fish in maintaining their relative positions. In the white sucker and the red-horse, two males pair with the female at one time, one on either side of her. In the hogsucker, six or eight males may pair with the female at one time. In each species, the female repeats the spawning act in many places and with different groups of males. The male does not enter into combat with other males, but coöperates with them. The relation of the sexes is thus promiscuity, not polyandry or polygamy; this promiscuity is not found in fishes in which combat takes place between the males.—*Bertram G. Smith.*

1618. RENNER, O. **Zur Biologie und Morphologie der männlichen Haplonten einiger Önotheren. [Biology and morphology of the male haplonts of some Oenotheras.]** Zeitschr. Bot. 11: 305-380. *39 fig.* 1919.

1619. RENNER, O. **Bemerkungen zu der Abhandlung von Hugo de Vries: Kreuzungen von Oenothera Lamarckiana mut. velutina. [Comments on the paper by Hugo de Vries: Crosses of Oenothera Lamarckiana mut. velutina.]** Ber. Deutsch. Bot. Ges. 36: 446-456. 1918.

1620. RICHARDSON, A. E. V. **Production of cereals for arid districts. Agricultural research in Australia.** Advisory Council Sci. and Ind. Commonwealth of Australia Bull. 7: 57-77. 1918.—Following a general discussion of location of arid regions, progress of cultural methods, differences between species and their ability to withstand drought, and relation of the migration ratio (i.e., ratio of grain to stalk) to drought-resistance, author describes the Hays centgener-plot system of wheat breeding. Cross-breeding as a method of producing new types is considered with brief summary of Mendel's principles. In this connection a list of dominant and recessive characters in wheat and barley is given.—Attempt was made to determine whether high and low yielding power are Mendelian characters. A high-yielding variety of wheat such as Federation or Yandilla King was crossed with one of low yield such as Huguenot. In the F_2 the plants were grown in centgener plots and each plant harvested separately. While the parental varieties give normal frequency curves the F_2 appears to show segregation into two distinct groups, one consisting of high yielding plants (several of which outyield the best parent) and one of low yielding plants. Progenies of both groups were grown and the results indicate that the observed differences were inherited.—By propagating the extreme plants found in F_3 of a cross between a two-rowed bearded and a six-rowed skinless variety of barley a new race has been obtained which is six-rowed and bearded and exceeds the parents in migration-ratio as well as in yield.—*J. H. Kempton.*

1621. ROBERTS, HERBERT F. **The founders of the art of breeding.** Jour. Heredity 10: 99-106. *4 fig.* Mar., 1919. *Ibid.* 10: 147-152. *1 fig.* Apr., 1919. *Ibid.* 10: 229-239. *1 fig.* May, 1919. *Ibid.* 10: 257-270. June, 1919.—See also Bot. Absts. 5, Entry 90.

1622. ROLFE, R. A. **The pre-Mendelian age.** Gard. Chron. 66: 288. Dec. 6, 1919.—Author takes somewhat positive attitude regarding MENDEL and the supposed sanctification of his results, basing his objections upon the fact that GOSS, SETON, KNIGHT and GÄRTNER all experimented with peas, obtaining concurrent results as to the uniformity in the F_1, and diversity in the F_2 generations, the overlooking of which data by MENDEL and his commentators, seems to the author curious, and a manifest fault subject to criticism. Author thinks that MENDEL has blinded all investigators to the merits of those who preceded him.—*H. [redacted] Roberts.*

1623. ROMELL, LARS-GUNNAR. **Något om artbildningsproblem. [On problems of the origin of species.]** Skogsvårdsföreningens Tidskr. 18: 92-100. 1920.—After brief description of different theories concerning origin of species author discusses rather particularly the treatise

of VAN DER WOLK, "Onderzoekingen ober blijvende modificaties en hun betrekking tot mutaties" [Researches on persistent modifications and their relation to mutations]. Cultura 1919. *K. V. Ossian Dahlgren.*

1624. S., W. [Rev. of: RIGNANO, EUGENIO. **Upon the inheritance of acquired characters: A hypothesis of heredity, development, and assimilation.** *413 p.* Open Court Publishing Co.: Chicago, 1911.] Science Progress 14: 514–515. Jan., 1920.

1625. SALISBURY, E. J. **Variation in Anemone apennina, L., and Clematis vitalba, L., with special reference to trimery and abortion.** Ann. Botany 34: 107–116. *9 fig.* Jan., 1920. —Author presents further data on his views relative to essential trimery of Ranunculaceae. In *A. apennina* perianth segments ranged from 9 to 21 with 34 per cent of the flowers departing from trimerous condition in perianth. Distribution of variations tends to be symmetrical about mode in contrast to condition in *A. nemorosa* where skewness was associated with lower modal value. Stamen number in *A. apennina* ranged from 48 to 111 (multiples of 3). Curve was multimodal with succession of trimerous modes, greatest frequency being at 72, 81 and 87; in 55.3 per cent of flowers staminal number was multiple of three; departure from modes explainable on basis of fission or fusion. In 57 3 per cent of flowers carpel number was multiple of 3, largest modes being at 60, 63, 51, and 57 with limits of range 27 and 87. One instance of a carpel with two stigmas suggested fission as cause of departure from trimery.—In *Clematis vitalba* the gynaecium of 1202 specimens furnished again a many-peaked curve with modes at multiples of three. There was a tendency for number of abortive carpels to increase as total carpel number increased. Abortion seemed to depend on conditions of nutrition and development and not on idiosyncrasies of pollinating agent.—*James P. Kelly.*

1626. SCHAFFNER, JOHN H. **A remarkable bud sport of Pandanus.** Jour. Heredity 10: 376–378. *1 fig.* NOV., 1919.

1627. SCHAFFNER, J. H. **The expression of sexual dimorphism in heterosporous sporophytes.** Ohio Jour. Sci. 18: 101–125. *25 fig.* 1918 —"The sexual condition is simply a state of the living substance which may continue for a greater or less length of time before a neutral state or the opposite sex condition is set up." Author maintains inadequacy of sex-chromosome mechanism for most plants, even suggesting that Allen's work on *Sphaerocarpus* is not conclusive. Body of paper involves examples of various stages in development of dioecious condition. No original monosporangiate flowers exist; few seeming examples show direct relationship to groups with opposite structures present. Usually dioecious condition comes directly from bisporangiate; sometimes monoecism is intermediate. Carpellate flowers more likely to retain vestiges of stamen structures, than are staminate to retain carpel parts. *Zizania aquatica* has staminate spikelets awnless, carpellate long-awned, bisporangiate short-awned; latency of awn factor caused by presence of male condition. *Cannabis sativa* normally an extreme example of dioecism, but plants grown under unusual conditions may show reversal of certain parts to opposite sex. Discusses genera (*Acer*, *Rumex*, *Fraxinus*) and larger groups which themselves show many gradations in the development of dioecism. Suggests inadequacy of sex-chromosome idea even in animal kingdom, though in some cases "hereditary factors may arise in a special chromosome which may assist in retaining and intensifying a male or female state already established." Sex-linked transmission can be readily explained without sex chromosomes. With assumption of sex chromosomes greater part of sexual phenomena becomes unexplainable and contradictory. Adds list of 41 plant species which are promising for investigation, describing general sexual condition of each.—*Merle C. Coulter.*

1628. SCHAXEL, JULIUS. **Über die Darstellung allgemeiner Biologie. [On the presentation of general biology.]** Abhandl. Theoret. Biol. *62 p.* 1919.—See Bot. Absts. 5, Entry 1426.

1629. SCHAXEL, J. **Grundzüge der Theorienbildung in der Biologie. [Principles of theory formation in biology.]** *221 p.* G. Fischer: Jena, 1919.—See Bot. Absts. 5, Entry 1426.

1630. Schellenberg, G. **Über die Verteilung der Geschlechtsorgane bei den Bryophyten.** [**On the distribution of sex organs in the bryophytes.**] Beih. z. Bot. Zentralbl. 37: 1-39. 1919.—See Bot. Absts. 5, Entry 1639.

1631. Schermers, D. **Erfelijkheid en rasverbetering.** [**Heredity and race-improvement.**] Schild en Pijl 10: 1-26. 1919.

1632. Schiemann, E. **Zur Frage der Brüchigkeit der Gerste—eine Berichtigung.** [**To the question of brittleness in barley—a correction.**] Zeitschr. indukt. Abstamm. Vererb. 21: 53. May, 1919.

1633. Schiemann, E. [German rev. of: Baerthlein, K. **Über bakterielle Variabilität, insbesondere sogenannte Bakterien-mutationen.** (**On bacterial variation, especially the so-called Bacteria mutations.**) Centralbl. Bakt. 81: 369-475. 1918.] Zeitschr. indukt. Abstamm. Vererb. 22: 303-304. May, 1920.

1634. Schiemann, E. [German rev. of: Bateson, W., and Ida Sutton. **Double flowers and sex linkage in Begonia.** Jour. Genetics 8: 199-207. *Pl. 3.* June, 1919. (See Bot. Absts. 3, Entry 2081.)] Zeitschr. indukt. Abstamm. Vererb. 22: 296-297. May, 1920.

1635. Schiemann, E. [German rev. of: Collins, E. J. **Sex segregation in the Bryophyta.** Jour. Genetics 8: 139-146. *Pl. 6, 5 fig.* June, 1919. (See Bot. Absts. 3, Entry 2103.)] Zeitschr. indukt. Abstamm. Vererb. 22: 296. May, 1920.

1636. Schiemann, E. [German rev. of: Correns, C. **Fortsetzung der Versuche zur experimentellen Verschiebung des Geschlechtsverhältnisses.** Sitzungsber. Akad. Wiss. 1918: 1175-1180. 1918.] Zeitschr. indukt. Abstamm. Vererb. 22: 293. May, 1920.

1637. Schiemann, E. [German rev. of: Kajanus, Birger. **Kreuzungsstudien an Winterweizen.** (**Studies on crossing winter wheat.**) Bot. Notiser 1918: 235-244. 1918. (See Bot. Absts. 4, Entry 622.)] Zeitschr. indukt. Abstamm. Vererb. 22: 292. May, 1920.

1638. Schiemann, E. [German rev. of: (1) Nilsson-Ehle, H. **Untersuchungen über Speltoidmutationen beim Weizen.** (**Experiments on speltoid mutations in wheat.**) Bot. Notiser 1917: 305-329. *1 fig.* 1917. (2) Kalt, B., and A. Schulz. **Über Rückschlagsindividuen mit Spelzweizeneigenschaften bei Nacktweizen der Emmerreihe des Weizens.** (**On atavists with spelt characters in naked wheat of the Emmer series.**) Ber. Deutsch. Bot. Ges. 36: 669-671. 1918. (See Bot. Absts. 4, Entry 624.)] Zeitschr. indukt. Abstamm. Vererb. 22: 291-292. May, 1920.

1639. Schiemann, E. [German rev. of: Schellenberg, G. **Über die Verteilung der Geschlechtsorgane bei den Bryophyten.** (**On the distribution of sex organs in the bryophytes.**) Beih. Bot. Zentralbl. 37: 1-39. 1919.] Zeitschr. indukt. Abstamm. Vererb. 22: 298. May, 1920.

1640. Schiemann, E. [German rev. of: Thellung, A. **Neure Wege und Ziele der botanischen Systematik erläutert am Beispiele unserer Getreidearten.** [**New methods and purposes of botanical taxonomy illustrated by examples of our cereal species.**] Naturw. Wochenschrift 17: 449-458, 465-474. *3 fig.* 1918.] Zeitschr. indukt. Abstamm. Vererb. 22: 293-295. May, 1920.

1641. Schmidt, J. **Experimentelle Konstanz og Arvelighedsundersogelser med Lebistes reticulatus (Peters) Regan.** [**Experimental studies on constancy and heredity in Lebistes reticulatus.**] Meddel. Carlsberg Lab. 14: 8. 1919.

1642. Schultz, W. **Gleichlauf von Verpflanzung und Kreuzung bei Froschlarven.** [**Parallelism between transplantation and crossing in frog larvae.**] Arch. Entwicklungsmech. Organ. 43: 361-380. *1 pl.* 1918.

1643. SEILER, J. [German rev. of: GOLDSCHMIDT, RICHARD. **Crossing over ohne Chiasmatypie? (Crossing over without chiasmatype?)** Genetics 2: 82–95. 1917.] Zeitschr. indukt. Abstamm. Vererb. 22: 215–216. Mar., 1920.

1644. SEMON, RICHARD. **Über das Schlagwort "Lamarckismus." [On the catch-word "Lamarckism."]** Zeitschr. indukt. Abstamm. Vererb. 22: 51–52. Dec., 1919.

1645. SHAMEL, A. D. **Origin of a new and improved French prune variety.** Jour. Heredity 10: 339–343. *Frontispiece, 3 fig.* Nov., 1919.

1646. SHAMEL, A. D. **A bud variation of the Le Grande Manitou dahlia.** Jour. Heredity 10: 367–368. *1 fig.* Nov., 1919.

1647. SHEPPARD, HUBERT. **Hermaphroditism in man.** Anat. Rec. 18: 259–260. April 20, 1920.—Author's abstract of paper read before American Association of Anatomists April 1–3, 1920:—In 1911 GUDERNATSCH asserted that "hermaphroditism in the sense that separate testicles and ovaries are found has not been demonstrated in man, nor even in other mammals beyond a doubt." In so far as we are able to determine, this assertion has not been questioned. We thought it worth while, in the light of this and other investigations, to report a study of the anatomical structures of an extreme case of hermaphroditism which came to the dissecting room.—The testicles in this individual were located in the scrotum and the ovaries in the pelvic cavity. The tissue from both organs proved to be normal in structure under a close microscopic examination. The broad ligament was thicker and wider than is usually found in a female subject, due to the fact that the uterus was a little lower in the pelvis than normal. The uterus measured about 5 cm. in length, 4 cm. in width and 2 cm. in thickness. A muscular wall, as well as a lumen which opened downward into the vagina, could be easily seen by both microscopic and macroscopic examinations. The oviduct took a normal course to the lateral angle of the uterus. A microscopic examination of the tube showed a lumen with walls containing the usual tunics. The cervix of the uterus passed into the inferior portion of the prostate about one-half inch below the urethra. The position of the organs might be described as follows: The bladder was superior and anterior to the uterus, with the prostate almost below the bladder, and a little anterior to the inferior portion of the uterus. Both are connected to the prostate, the urethra entering the prostatic substance near its superior anterior surface, the cervix of the uterus occupying the lower two-thirds. The cervix of the uterus held almost the exact position of the utriculus prostaticus of the male.—Externally the genitalia featured decidedly as a male. However, upon a closer examination of the region, and palpation of the organs, certain irregularities could be observed. The penis was small with a urethral orifice three-fourths as large as the organ itself. The opening gradually increased in size until it terminated at the cervix of the uterus. This portion of the urethra was in all respects a vagina attached to the inferior surface of the penis. Both the lumen of the uterus and the urethra opened directly into the vaginal opening.—It has been found in all true cases of hermaphroditism that there is always a sharp distinction between the male and female genital tissue and never an indefined mixing of the two elements (true ovitestis). In this unusual case we found the same phenomenon with a wider separation of the two kinds of tissue, the testes and ovaries in the exact position of a normal individual.—*Hubert Sheppard.*

1648. SHULL, GEORGE H. **A third duplication of genetic factors in shepherd's-purse.** Science 51: 596. June 11, 1920.—Author's abstract of paper read before American Philosophical Society, April 23, 1920.—In the third generation of a cross between a wild biotype of the common shepherd's-purse (*Bursa bursa-pastoris*) from Wales and Heeger's shepherd's-purse (*B. Heegeri*) there appeared a small number of plants of unique type, having a more coriaceous texture than in the plants of either of the two original strains involved in the cross. This new type has been designated *coriacea*. It differs from the common form, not only in texture, but the lobing of the leaf is reduced and simplified and the angles of the lobes are almost spinescent. The proportion of *coriacea* to the typical sibs in this F_3 family was 12:187 or

almost exactly a 1:15 ratio. This suggested at once the presence of two independently inherited factors for the normal texture, the *coriacea* type being produced only when these two factors *K* and *L* were absent. Subsequent breeding has shown that *coriacea* breeds true when selfed, and has also confirmed the interpretation of this as a third case of duplication of factors in this species. The two characters previously shown to be thus constituted are the triangular form of capsule, and the division of the leaf to the midrib which brings to light the characteristic lobing found in the form designated *rhomboidea*. The duplication of the capsule determiners is practically universal while that of the leaf-lobe factor is less frequently found. Studies on the *coriacea* character are still too limited in extent to justify a statement as to the prevalence of duplication of the factor for the usual texture of the leaves.—*George H. Shull.*

1649. Siemens, H. W. **Rashygienens biologiska grundvalar.** [**Biological foundations of race hygiene.**] *98 p.* Gleerup: Lund, 1918.

1650. Siemens. [German rev. of: Haecker, V. **Die Erblichkeit im Mannesstamm und der vaterrechtliche Familienbegriff.** (**Inheritance in man and the male-line concept of the family.**) *32 p.* Gustav Fischer: Jena, 1917.] Zeitschr. indukt. Abstamm. Vererb. **22**: 213. Mar., 1920.

1651. Sirks, M. J. **Verwantschap als biologisch vraagstuk.** [**Relationship as a biological problem.**] Genetica **2**: 27–50. Jan., 1920.

1652. Sirks, M. J. **De analyse van een spontane boonenhybride.** [**Analysis of a spontaneous bean hybrid.**] Genetica **2**: 97–114. Mar., 1920.

1653. Sirks, M. J. **Uit het Instituut voor Veredeling van Landbouwgewassen. Vergelijking van gerst en tarwerassen, van het Instituut afkomstig met andere voortreffelijke rassen van deze gewassen 1915–1917.** [**From the Institute for the Improvement of Agricultural Plants. Comparison of barley and wheat varieties originating from the Institute with other superior races of these plants 1915–1917.**] Med. Landb.-Hoogeschool Wageningen **14**: 1–34, 210–232. 1918.

1654. Sirks, M. J., and J. Bijhouwer. **Onderzoekingen over de eenheid der linneaansche soort Chrysanthemum leucanthemum L.** [**Investigation of the homogeneity of the Linnean species Chrysanthemum leucanthemum L.**] Genetica **1**: 401–442. Sept., 1919.

1655. Soler, Rafael Angel. **Cultivo del tomate.** [*Tomato culture.*] *Revist. Agric. Com. y Trab.* **2**: 479–483. *8 fig.* 1919.

1656. Sperlich, Adolf. **Die Fähigkeit der Linienerhaltung (phyletische Potenz), ein auf die Nachkommenschaft von Saisonpflanzen mit festem Rhythmus ungleichmässig übergehender Faktor.** [**Capacity to maintain lines (phyletic potency), a factor distributed irregularly to the offspring of plants with fixed seasonal rhythm.**] Sitzungsber. Akad. Wiss. Wien **128**: 379. 1919. —See Bot. Absts. 5, Entry 1559.

1657. Sperlich, Adolf. **Über den Einfluss des Quellungszeitpunktes, von Treibmitteln und des Lichtes auf die Samenkeimung von Alectorolophus hirsutus All.: Charakterisierung der Samenruhe.** [**On the influence of the time of application of forcing-agents and of light on the germination of seeds of Alectorolophus hirsutus. Characterization of seed rest.**] Sitzungsber. Akad. Wiss. Wien **128**: 477. 1919.—See Bot. Absts. 5, Entry 1559.

1658. Spragg, Frank A. **The spread of Rosen rye.** Jour. Heredity **11**: 42–44. *1 fig.* Jan., 1920.

1659. Stein, E. [German rev. of: Klebahn, H. **Impfversuche mit Pfropfbastarden.** (**Infection experiments with graft hybrids.**) Flora **11–12**: 418–430. 1918.] Zeitschr. indukt. Abstamm. Vererb. **22**: 304. May, 1920.—See also Bot. Absts. 3, Entry 2124.

1660. STEIN, E. [German rev. of: VAN HERWERDEN, M. A. **De invloed van radiumstralen op de ontwikkeling der eieren van Daphnia pulex. (Effects of the rays of radium on the oogenesis of Daphnia pulex.)** Genetics 1: 305–320. July, 1919. (See Bot. Absts. 3, Entry 1044.)] Zeitschr. indukt. Abstamm. Vererb. 22: 286–287. May, 1920.

1661. STEINACH, E. **Histologische Beschaffenheit der Keimdrüse bei homosexuellen Männern. [Histological condition of the gonads in homosexual men.]** Arch. Entwicklungsmech. Organ. 46: 29–37. *Pl. 3–5.* 1920.—Interstitial cells characteristic of the ovary were found in the testes of several homosexual men, associated with degeneration of male interstitial cells, and of the seminal tubules. As reported elsewhere (STEINACH und LICHTENSTERN, Münch. med. Wochensch. Nr. 6, 1918), these testes were removed and cryptorchid testes with normal puberty gland implanted, restoring normal sexual instincts to the homosexuals.—*H. D. Goodale.*

1662. STEINACH, E. **Künstliche und natürliche Zwitterdrüsen und ihre analogen Wirkungen. [Artificial and natural hermaphroditic glands and their analogous functioning.]** Arch. Entwicklungsmech. Organ. 46: 12–28. 1920.—A discussion of castration, feminization, masculinization, and hermaphroditization, some of it based on work previously unpublished, with particular reference to the similarity between homosexuals and certain artificial hermaphrodites. Two instances of homosexual goats are described.—*H. D. Goodale.*

1663. STOCKARD, CHARLES R., AND G. N. PAPANICOLAOU. **Variations of structural expression in the inheritance of polydactyly.** Anat. Rec. 18: 262–263. April 20, 1920.—Author's abstract of paper read before American Association of Anatomists, April 1-3, 1920.—The inheritance of polydactyly in a strain of guinea-pigs has been studied for the past several years. This character when it appears in the race is inherited as a Mendelian dominant.—The expression of the character in a series of individuals presents a most striking condition. The extra toe on the hind foot may be a perfectly developed functional toe in one animal, while in others the toe presents varying degrees of imperfect development and structure until in some it is represented by only a minute toe-nail attached to the foot by a thread-like filament. This poorly formed toe is frequently broken off or lost shortly after birth, and would often escape notice if not carefully looked for. Other animals inherit the extra toe, but fail to develop it sufficiently to show any evidence of its existence at birth. The fact that these have the character for extra toes is demonstrated by their offspring which may exhibit the toe as frequently as do offspring from parents with well-expressed polydactyly.—These normal variations in the expression of this dominant character renders it a most uncertain quantity for judging the influences of experimental treatments on its inheritable behavior in different groups of animals.—*Charles R. Stockard and G. N. Papanicolaou.*

1664. STOMPS, THEO. J. **Über zwei Typen von Weissrandbunt bei Oenothera biennis L. [On two types of white margins in Oenothera biennis L.]** Zeitschr. indukt. Abstamm. Vererb. 22: 261–274. May, 1920.

1665. STOUT, A. B. **The aims and methods of plant breeding.** Jour. New York Bot. Gard. 21: 1–16. Jan., 1920.—Author notes rise of subject during past three decades which has culminated in the present day development of genetics. Broadly considered, plant breeding, through selection of seed parents, is older than written history, but modern methods of plant breeding are based on a knowledge of sexuality in plants. Notes work of early investigators in study of sexuality, hybridization and selection including the early pedigree methods of LE COUTEUR and SHIRREFF, also the early work on sugar beets.—Importance of hybridization as a means of inducing variation is noted. Also development and importance of chromosome theory of inheritance and Mendel's Law. The rise of the mutation theory, linkage, multiple and modifying factors is also noted. Author notes "the germ plasm is the seat in which most of the hereditary changes occur." Cites the case of the 6,500 varieties of *Dahlia* in cultivation in the United States, all of which have descended from a single American species during the past 130 years. Similarly with *Phlox*, 200 varieties of which have descended from a single

wild Texan species which was introduced into cultivation in 1835.—Importance of bud sports is noted in the case of the Sword fern and variegated *Coleus* and also with the citrus fruits.—Discusses modern method of plant breeding with respect to pedigree culture, and summarises: "In practical application, the methods of plant breeding are (1) to maintain in a highly productive condition races whose qualities make their cultivation desirable, (2) to recognise and preserve new characteristics which may lead to further improvement, (3) to combine qualities of different strains into one strain through crossing, and (4) to induce hereditary variation through hybridization. Plant breeding aims to regulate, to control, to direct, and to utilize the processes of heredity and variation."—*C. E. Myers.*

1666. Streeter, Geo. L. **Formation of single-ovum twins.** Bull. Johns Hopkins Hospital 30: 235–238. *4 fig.* 1919.—The mature ovum here referred to is the one previously described by the same author (Carnegie Inst. Washington Publ., 272.) The ovum, which is about 17 days old, contains two embryos. One of these is considerably more advanced than the other. The primary embryo is in the primitive-groove stage, and has an embryonic plate 0.92 mm. long by 0.78 mm. wide. Two small vesicles slightly separated from each other are found in the loose mesenchyme in the posterior region of the body-stalk. These two vesicles represent the Amniotic vesicle and the yolk-vesicle, respectively, of the smaller twin. This small embryo is undoubtedly abnormal. By comparing this ovum with the Miller specimen and the Bryce-Teacher specimen, the author is able to indicate how in all probability monozygotic, or identical twins are formed. The ovum is one of unusual interest, in that it shows the youngest stage of twinning so far recorded for the human species.—*J. T. Patterson.*

1667. Strong, Leonell C. **Roughoid, a mutant located to the left of sepia in the third chromosome of Drosophila melanogaster.** Biol. Bull. 38: 33–37. Jan., 1920.—New mutant, characterized by roughened eyes, found to lie to the left of sepia, which had been furthest to the left of known third-chromosome loci. Roughoid sepia crossover value of 24.9 was obtained. —*A. H. Sturtevant.*

1668. Stuckey, H. P. **Work with Vitis rotundifolia, a species of Muscadine grapes.** Georgia Agric. Exp. Sta. Bull. 133: 60–74. *4 pl. (colored), 8 fig.* Dec., 1919.—Work with *rotundifolia* was started at the Experiment Station in 1909. A history of workers with this species of grape is given. The work at the Station bears out the fact that *Vitis rotundifolia* is self-sterile, though the fruiting vines produce pollen. This pollen is infertile due to a degeneration of the generative nuclei. Work with more than two thousand seedlings which have been brought into bearing shows that approximately one-half are males and one-half are females. The male vines are more vigorous in growth and a larger percentage of these produce flower before the female vines. In more than one thousand bearing vines, it was found that the color of the tendrils and new growth correspond to the color of the fruit; vines having red or reddish green tendrils bear black or reddish black grapes, while those with green tendrils, internodes and new growth, produce light or amber-colored fruit, as the Scuppernong. Male vines fall into these two groups just as the females except they bear no fruit. Black is dominant over white and latter color is pure recessive. A formula showing crosses between plants heterozygous for black, red and white is given. Thomas × dark male produced only plants with dark fruit, but seedlings from Scuppernong × dark male produced plants of different colors of fruits. Certain male vines were prepotent for quality. In Flowers × light male no. 1, out of 41 seedlings, only one produced fruit inferior in flavor to the Flowers; the others were superior. From nine vines of Flowers × Black No. 1, only one produced fruit equal in flavor to the Flowers. New varieties described are Hunt, Irene, November, Qualitas, Spalding and Stuckey. It is further stated that pruned vines growing by the trellis system, when in good bearing should produce 50 to 60 pounds or about a bushel of fruit per year. Test of various strains of Scuppernongs, which is the most common variety of *Vitis rotundifolia*, demonstrated that nurserymen have made some effort to eliminate poor-bearing types and those untrue to name. Last page of the bulletin details methods of planting and pruning, and uses of the fruit.—*T. H. McHatton.*

1669. STUBTEVANT, ROBERT S. **Hybridizing bearded irises.** Gard. Chron. 67: 184. April 10, 1920.—Refers to a number of crosses of horticultural varieties and presents evidence to show that *plicata* characters are not due to a recessive factor as proposed by BLISS [see Bot. Abstr. 5, Entry 1460]; also indicates that in the *Iris*, venation acts as a simple Mendelian dominant but that in regard to color and its disposition in other ways a more complex explanation is needed.—*J. Marion Shull.*

1670. SUMNER, FRANCIS B. **Geographic variation and Mendelian inheritance.** Jour. Exp. Zool. 30: 369–402. *7 fig.* April 5, 1920.—Paper is continuation of earlier biometric and genetic work on geographic races of deer-mouse (*Peromyscus maniculatus*) found in California. Characters chosen for study were length of tail, foot, ear, pelvis, femur and skull, width of dorsal tail stripe, color of pelage, pigmentation of foot and number of caudal vertebrae. Fewer grades for any one character have been found than number of localities from which material was collected. Members of same subspecies collected from different localities often differ widely. To a certain extent and for certain characters gradations considered follow geographic and climatic sequence. Degrees of difference in characters are, however, not proportional to geographic intervals between races and there are other incongruities which greatly complicate the situation. Characters which vary together, when geographic sequence is considered, may or may not vary together within any single local collection and *vice versa*. It seems that special factors, operating locally, must be responsible for modification of parts which do not ordinarily vary together. Animals from coastal stations, which probably present graded series in respect to both temperature and humidity, show similar gradation in respect to mean width of tail stripe and mean length of tail, foot and ear. Suggestion is made that environment in course of time has modified characters of animals dwelling at various points. Variations within each race are partly hereditary and partly 'somatic' in origin. Differences between local races do not act, in crossing, as simple Mendelian factors although theory of multiple factors would undoubtedly be invoked by many geneticists. Author prefers theory of contamination of genes. Deviations from type of various characters in F_1 and F_2 generations have been compared. Conclusion is made that variation is slightly greater in F_2. Incidentally differences have been observed between sexes, viz., smaller feet and larger pelvis in females. These are attributed to presence of at least two hormones varying independently.—*P. W. Whiting.*

1671. SUTTON, ARTHUR W. **Brassica crosses.** Gard. Chron. 67: 20. Jan. 10, 1920.—Issue is taken with the statements of a writer in a recent issue of the journal in regard to crosses between cauliflower and kohl-rabi. Cauliflower crosses readily with any other type of *Brassica* but the resulting forms are worthless.—*C. B. Hutchison.*

1672. TAMMES, T. **De leer der erffactoren en hare toepassing op den mensch. Rede, uitgesproken bij het aanvaarden van het ambt van buitengewoon hoogleeraar aan de Rijks-Univ. te Groningen.** [The theory of hereditary factors and its applicability to man. Address, delivered on assumption of the office of Professor Extraordinarius in the State University at Groningen.] 24 p. Wolters: Groningen., 1919.

1673. TH., G. **Systematic breeding.** Florists' Exchange 49: 882. April 10, 1920.—Popular account of the value of systematic breeding based on a knowledge of the laws of heredity, especially as applied to carnation breeding. Lack of such knowledge may result in an occasional striking prize in commercial breeding, but no continuous series of successes. Describes some work of carnation breeders.—DORNER & SONS, WARD, and FISHER. Systematic breeding in the hands of these men brought the five-inch carnation and many other improvements. DORNER & SONS' promising new carnation productions are tested out by SAMUEL GODDARD, Framingham, Mass. Carnation breeding is toward better keeping qualities, better form and color, larger number of blooms per plant without decrease in flower size and production of a good yellow type.—*Orland E. White.*

1674. TH., G. **Systematic breeding organization proposed.** Florists' Exchange 49: 1089. May 8, 1920.—Discussion of the advantages of systematic breeding and of the formation of a

society of growers interested in applying theoretical knowledge to their own problems. Records of practical breeders' work should be kept by a central body. Work is often repeated through lack of an organization through which knowledge can be distributed. Many a valuable discovery has probably been made by individual workers and then lost to the world because the records have not been passed on. Author says "Darwin's theories today are repudiated to a large extent, while Mendel's law is recognized."—*Orland E. White.*

1675. Thomson, J. Arthur. [French rev. of: Macleod, J. **The quantitative method in biology.** *15 x 23 cm., v+228 p., 27 fig.* Longmans, Green & Co.: New York, 1919. (See also Bot. Absts. 4, Entry 758.)] Scientia 27: 244-246. 1920.

1676. Tischler, G. [German rev. of: (1) Renner, O. **Ueber Sichtbarwerden der Mendelschen Spaltung im Pollen von Oenotherabastarden. (On the visibility of Mendelian segregation in hybrids of Oenothera.)** Ber. Deutsch. Bot. Ges. 37: 129-135. 1919. (2) Idem. **Zur Biologie und Morphologie der männlichen Haplonten einiger Önotheren. (Biology and morphology of the male haplonts of some Oenotheras.)** Zeitschr. Bot. 11: 305-380. *59 fig.* 1919.] Zeitschr. indukt. Abstamm. Vererb. 22: 221-223. Mar., 1920.

1677. Tornau, Dr. **Einige Mitteilungen über variabilitätsverhältnisse in einem konstanten Weizenstamm. [Some communications concerning variability relations in a constant wheat strain.]** Jour. Landw. 67: 111-149. 1919.—A biometrical study of variability and correlation in a pure line of wheat, the constants for different years being compared.—*C. E. Leighty.*

1678. Van Fleet, W. **Rose-breeding notes for 1918.** Amer. Rose Ann. 1919: 29-35. 1919.—Description of results from crossing numerous species and types of roses. Considerable improvement is seen in newer hybrids of *Rosa rugosa, R. Hugonis, R. Soulieanea, R. Moyesii.* Color range in *R. rugosa* hybrids covers single and double, constant-blooming forms in clear whites to glowing crimsons. No pure yellows. Creams, common and bright yellows may be expected in time. Main ideal for *R. rugosa* hybrids is high class blooms of Hybrid Perpetual and Hybrid Tea types combined with vigorous, hardy, disease-resistant plants. Premier English rose of 1918 is Mermaid, said to be result of *R. bracteata* crossed with a tea-scented variety. Efforts are being made to secure hybrids of *R. bracteata* able to endure climate of northern plains region, hybrids of *R. bracteata* × *R. carolina* giving promising results, and enduring zero weather. They have beautifully-formed pink buds. No success has been attained in attempts to cross Harison's Yellow for over 20 years. More success with seedlings of this variety, especially one similar to one of reputed parents of Harison's Yellow. Out of many thousand seeds of Harison's Yellow sown, only three grew so far. There is possibility of fragrance of the sweetbrier being intensified through breeding work.—*Orland E. White.*

1679. van Wisselingh, C. **Über Variabilität und Erblichkeit. [Concerning variability and heredity.]** Zeitschr. indukt. Abstamm. Vererb. 22: 65-126. *10 fig.* Jan., 1920.—Emphasizes importance of a study of the lower and simpler plants in the attempt to get at fundamentals of heredity and variation. Many illustrations are cited from author's and Gerassimoff's extensive studies of *Spirogyra.* Variations in the form and size of the cell, thickness and markings of cell walls, number and form of chromatophores, presence or absence of pyrenoids and method of starch-formation, number of nuclei, abnormalities in nuclear and cell-division, number of chromosomes, and nature and development of nucleoli are described in detail, and the causes giving rise to them are discussed. Variations in cell length, rate of starch formation and cell division may be induced through alterations in amount of light, but are not heritable. Thickness and markings on cell walls are heritable even in cells without nuclei. Chromatophores without pyrenoids form starch in a diffuse manner and are passed on through innumerable cell generations regardless of environmental conditions. Binucleate cells may be produced through anaesthesia, low temperatures, or centrifuging. This condition is perpetuated by cell division and so is heritable. Instead of two nuclei there may be one giant nucleus. In either case the cells assume a much larger diameter which is inherited

both through cell division and conjugation. Author concludes that the nucleus is not the sole bearer of hereditary factors but that on the contrary heritable variations may arise in and be transmitted by the chromatophores and the cytoplasm.—*Leonas L. Burlingame.*

1680. VESTERGAARD, H. A. B. **Observations on inheritance in lupines, wheat, and barley.** Tidsskr. Planteavl. 26: 491–510. *7 fig.* 1919.

1681. VIGIANI, D. **Sulla selezione del frumento "Gentil Rosso."** [Upon the selection of the wheat "Gentil Rosso."] Staz. Sper. Agr. Italiane 52: 5–13. 1919.

1682. VOGT, A. **Der Altersstar, seine Heredität und seine Stellung nach exogener Krankheit und Senium.** [Senile cataract, its heredity and its place in exogenous disease and senile degeneration.] Zeitschr. Augenheilkunde 40: 123. 1918.

1683. VON GRAEVENITZ. [German rev. of: CRANE, M. B. **Heredity of types of inflorescence and fruits in tomato.** Jour. Genetics 5: 1–10. 1915.] Zeitschr. indukt. Abstamm. Vererb. 22: 223–224. Mar., 1920.

1684. VON UBISCH, G. **II. Beitrag zu einer Faktorenanalyse von Gerste.** [Contribution to a factorial analysis of barley.] Zeitschr. indukt. Abstamm. Vererb. 20: 65–117. *7 fig., 11 diagrams.* Jan., 1919.

1685. VON WETTSTEIN, FRITZ. **Vererbungserscheinungen und Systematik bei Haplonten und Diplohaplonten im Pflanzenreich.** [Genetical phenomena and taxonomy in haplonts and diplonts in the vegetable kingdom.] Zeitschr. indukt. Abstamm. Vererb. 21: 233–246. Nov., 1919.

1686. W., B. C. A. [Rev. of: PUNNETT, R. C. **Mendelism.** *5th ed.*, Macmillan & Co.: London, 1919.] Jour. Botany 57: 357–358. 1919.

1687. W., F. A. **The meaning of continuous variation in color.** Jour. Heredity 11: 84–86. *1 fig.* Feb., 1920.

1688. WALDRON, L. R., AND J. A. CLARK. **Kota, a rust resisting variety of common spring wheat.** Jour. Amer. Soc. Agron. 11: 187–195. *1 pl.* 1919.—A variety of bearded hard red spring wheat, named Kota, has been found to possess resistance to the form or forms of stem rust of wheat present at Fargo, North Dakota, Brookings, South Dakota, and St. Paul, Minnesota, in 1918. Preliminary tests with Kota show it to have yielding ability. In baking tests it ranked high when compared with other bread wheats.—*H. K. Hayes.*

1689. WALDRON, L. R. **First generation crosses between two alfalfa species.** Jour. Amer. Soc. Agron. 12: 133–143. 1920.—*A report on the weight of plants of the first generation* hybrids, secured by crossing *Medicago sativa* (common alfalfa) with *Medicago falcata* (yellow-flowered). The hybrids showed 47.5 per cent more weight than the parents. No significant differences were observed in the heights of the hybrid and the non-hybrid plants. Increased weight was then probably due to an increased number of stems per plant. Plants of *M. falcata* showed less winter-killing than the other groups.—*F. M. Schertz.*

1690. WANGERIN, W. **Der Generationswechsel im Tier- und Pflanzenreich.** [The alternation of generations in the animal and plant kingdoms.] Schrift. Naturf. Ges. Danzig 15: 1–13. 1918.

1691. WARREN, DON C. **Spotting inheritance in Drosophila buscki Coq.** Genetics 5: 60–110. *1 pl., 4 fig.* Jan., 1920.—Variation was noted among males of *D. buscki* in number of spots on tergum of fifth abdominal segment. Selection isolated two types, the two-spot and the six-spot, although the germinal behavior of the three separate strains was distinct. Crosses indicate that (1) the same high factor has been isolated in all three strains; (2) the

high or low is neither completely dominant to the other; (3) the female may transmit the factor for specific configuration although she is always of the six-spot type.—Stock 501 gave a mutant with an exceptionally large outer spot. Tests with two-spot line indicate that the factor for the middle spots may be sex-linked in this particular strain.—Temperature has a differential effect on spotting. Low temperatures (11–15°C.) emphasize outer spots and reduce the middle ones, even in the two-spot selected lines.—Six females appeared simultaneously in one stock, lacking the middle spots. When mated to brothers, these gave rise to a variable abnormal strain. Selection purified the stock. Crosses show that male can transmit the factor, although not showing the character himself.—To conclude, inheritance of spotting in *D. buzzkii* is complicated. The same spot in the female and in different strains of males are due to different factors. Environment, particularly temperature, has a differential effect on the development of the various spots, and is important in the interpretation of selection.—*Joseph Krafka, Jr.*

1692. Weatherwax, Paul. **The origin of the intolerance of inbreeding in maize.** Amer. Nat. 54: 184–187. Mar.–Apr., 1920.—In regard to androgyny and to protogyny of individual inflorescences maize presents no fundamental difference from other American representatives of Maydeae. This fact together with reduction in number of inflorescences due to the mode of long continued cultivation and hence widespread cross-pollination make it unnecessary to assume the introduction of intolerance of self-pollination from another group.—*D. F. Jones.*

1693. Weimer, J. L. **Variations in Pleurage curvicolla (Wint.) Kuntze.** Amer. Jour. Bot. 6: 406–409. 1919.—Data on the extent of variation in certain characters due to differences in substratum upon which a pure strain of *Pleurage curvicolla* was grown, indicates unreliability of taxonomic criteria for species formation in fungi. Spore size was found to be relatively constant but size of perithecia showed greater variation and secondary spore appendages, a recognized character for this species, were not seen. Observations of author and others indicate that this species may have 128, 256, or 512 spores in ascus as a result of 7, 8 or 9 mitoses. [See also Bot. Abstr. 5, Entry 694.]—*T. H. Goodspeed.*

1694. Wenholz, H. **Maize breeding. Agricultural research in Australia.** Advisory Council Sci. and Ind. Commonwealth of Australia Bull. 7: 39–48. 1918.—Author believes that improvement of maize can be accomplished largely by selection within a variety and therefore the experiment farms of New South Wales have been restricted to the use of one variety which previous experience has shown to be the best for the district.—Study of ear characters had led to the conclusion that some of them are associated with yield. These characters are length and shape of ear, weight and percentage of shelled grain, space between the rows, filling and character of the butts and tips, depth of grain and size of core. The ideal ear with many of these desirable characters highly developed has not been found by experiment to be positively correlated with yielding capacity under all conditions.—Data are being collected to discover what visible characters in the ear are associated with yielding capacity. Thus far it is found that although depth of grain is correlated with yield in a late-maturing variety on the coast, this correlation does not exist with the early variations of the tablelands. In regions of good rainfall, moderate-sized core is correlated with yielding capacity while in regions of scanty rainfall smallness of core is a character somewhat related to drought resistance but not to very high yields.—Another measurable ear character found to be related to yield is the weight. Author states that uniformity in the appearance, size, shape of ear, and character of the indentation of the grain gives a greater uniformity in the maturing of the crop and in consequence a greater uniformity in flowering which latter has been found to be directly associated with a smaller percentage of barren stalks.—Ear-to-row breeding is highly recommended and in ear-to-row tests author notes having made some very careful observations which have thrown considerable light on maize breeding and selection. It has been found, for instance, that some rows from individual ears contain a high percentage of barren stalks while other rows have practically none. It has also been found that many of the highest-yielding rows in the tests have been most uniform in the type of ears produced. Author considers that this observation supports the practice of breeding for uniformity in

ear type.—In breeding for early maturity author recommends selecting early-maturing plants in the field instead of the longer process of elimination of the late-maturing types in the variety by gradual acclimatization.—In breeding for drought-resistance the greatest difficulty to be overcome is the "blasting" effect of hot, dry winds on pollen viability, although in some districts this is obviated by planting at the proper time. It is stated that while breeding may produce a drought-resistant pollen it must be borne in mind that the limitation of moisture in the soil is also a contributing factor in low yields.—*J. H. Kempton.*

1695. WHITE, ORLAND E. [Rev. of: EAST, EDWARD M., AND DONALD F. JONES. **Inbreeding and outbreeding.** *14 x 21 cm., 285 p., 46 fig.* J. B. Lippincott: Philadelphia, 1919.] Torreya 20: 32–34. Mar.–Apr., 1920.—See also Bot. Abstr. 4, Entry 571; 5, Entries 437, 1607.

1696. WIGGANS, C. C. **Some factors favoring or opposing fruitfulness in apples.** Missouri Agric. Exp. Sta. Res. Bull. 32: 1–60. *6 fig.* 1918.—Studied individual fruit spurs of six commercial varieties of apples. Three varieties were known as annual bearers and these developed fairly high percentage of blossoms each year while three were classed as alternate bearers. Two of the annual bearers were able to develop blossoms in successive seasons on the same spur in much greater proportion than other varieties observed. Bearing spurs ranged from 2 to 8 years in age, 3 to 6 or 7 years being most effective fruiting age.—Found slightly higher concentration of sap (freezing point method) in bearing than in non-bearing spurs and noted marked decrease in sap concentration in late June or early July. Sugar and starch were shown by chemical methods to be present in slightly greater quantities in bearing than in non-bearing spurs. Determined effect of girdling, fertilizers, cultural treatments, and etherization on concentration of cell sap.—*H. K. Hayes.*

1697. WILDER, HARRIS HAWTHORNE. **Physical correspondence in two sets of duplicate twins.** Jour. Heredity 10: 410–420. *Fig. 15–19.* Dec., 1919.

1698. WINTERS, A. Y. **Eugenics, the war instinct and democracy.** Jour. Heredity 10: 254–256. June, 1919.

1699. WOODS, FREDERICK ADAMS. **Twins prove the importance of chromosomes.** Jour. Heredity 10: 423–425. Dec., 1919.

1700. WOODS, FREDERICK ADAMS. **A definition of heredity—"Nature vs. nurture" not a good expression.** Jour. Heredity 10: 426–427. Dec., 1919.

1701. WRIEDT, CHR. **The brindle colour in cattle in relation to red.** Jour. Genetics 9: 83. Dec., 1919.—Author concludes from records on Telemark breed in Norway that brindle is dominant to red (and not a heterozygote between red and black as J. CARLSON had concluded), on the basis of the following: Brindle × brindle or brindle × red gives both brindle and red, but red × red gives only red. Black is said to be very rare in this breed, the characteristic colors being brindle and red.—*J. A. Detlefsen.*

1702. ZELENY, CHARLES. **A change in the bar gene of Drosophila melanogaster involving further decrease in facet number and increase in dominance.** Jour. Exp. Zool. 30: 293–324. *9 fig.* April 5, 1920.—Author, who has for some time been studying the effect of selection upon the physical appearance and hereditary determiners ("bar gene") of the barred eye of *Drosophila melanogaster*, reports several mutants that have arisen in respect to this character. Bar gene, which is sex-linked, is concerned with the production of an eye with a greatly reduced number of facets (an average of about seventy-five, instead of the usual eight hundred of normal "full-eye" flies). The F_1 generation of bar by full-eye is nearly intermediate between the parents. To avoid the effects of varying temperature, the flies of these data were reared at uniform temperature. Though considerable variability occurs in facet number, one male appeared, having only nineteen facets, a number markedly lower than the lowest otherwise known for bar eye. This fly produced a race with average of twenty-two or twenty-

three facets. The gene concerned is named ultra-bar, and shows a marked dominance over both bar and full-eye, so that the F_1 generation has eyes almost as small as those of ultra-bar. Crossing-over tests seem to show that ultra-bar is an allelomorph of bar. Author calls attention to this evidence of mutation in a gene during selection, but thinks the direction of mutation probably not significant inasmuch as mutations toward full-eye have also occurred.—*John S. Dexter.*

HORTICULTURE

C. H. Gourley, *Editor*

FRUITS AND GENERAL HORTICULTURE

1703. Allen, W. J. **Orchard notes. February.** Agric. Gaz. New South Wales 31: 142-143. 1920.

1704. Allen, W. J. **Apricot growing in New South Wales.** Agric. Gaz. New South Wales 31: 201-207. *1 fig.* 1920.

1705. Allen, W. J. **Peach growing in New South Wales.** Agric. Gaz. New South Wales 31: 127-133. *2 fig.* 1920.

1706. Allen, W. J., and W. C. G. Brereton. **Orchard notes. January.** Agric. Gaz. New South Wales 31: 65-67. 1920.

1707. Allen, W. J., and W. le Gay Brereton. **Orchard notes.** Agric. Gaz. New South Wales 31: 204-205. 1920.

1708. Allen, W. J., and S. A. Hogg. **Cherry growing in New South Wales.** Agric. Gaz. New South Wales 31: 277-279. 1920.

1709. Allen, W. J., and S. A. Hogg. **Orchard notes. March.** Agric. Gaz. New South Wales 31: 221-222. 1920.

1710. André, G. **Sur l'inversion du sucre de canne pendant la conservation des oranges.** [**The inversion of sucrose in oranges during storage.**] Compt. Rend. Acad. Sci. Paris 170: 126-128. 1920.—See Bot. Absts. 5, Entry 2193.

1711. Anonymous. **The cocoanut raft.** Sci. Amer. 122: 339. *1 fig.* 1920.

1712. Anonymous. **Lime sulphur spray following Bordeaux.** New Zealand Jour. Agric. 19: 371-374. 1919.—See Bot. Absts. 5, Entry 2001.

1713. Anonymous. **The most valuable crop.** Sci. Amer. Monthly 1: 316. 1920.—A note concerning the value of the cocoanut palm.—*Chas. H. Otis.*

1714. Anonymous. **Liming fruit trees.** Jour. Dept. Agric. Victoria 17: 699. 1919.—The following formula is given for washing tree trunks: 10 pounds of fresh quicklime in 50 gallons of water, enough water being added at first to cover the lime, add 8 pounds of flowers of sulphur, allow to boil for 20 minutes, and add the remaining quantity of water.—*J. J. Skinner.*

1715. Anonymous. **Conference on fruit growing.** Jour. Roy. Hortic. Soc. 45: 60-80. 1919.—This is a report of a discussion of the distribution, varieties, disease control, and grading of deciduous fruits.—*J. K. Shaw.*

1716. Anonymous. **Revival of indigo.** Sci. Amer. Supplem. 88: 271, 279. 1919. [Abstract.]

1717. ANONYMOUS. **Spraying programs for the orchard and fruit garden.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 67–78. 1920.

1718. BAKER, C. F. **Coöperative seed exchange.** Philippine Agric. 8: 19–21. 1919.—This paper gives a list of tropical plants, seeds of which are desired by the College of Agriculture (Philippine Islands) in exchange for seeds of the College stock.—*S. F. Trelease.*

1719. BALLOU, F. H., AND I. P. LEWIS. **Horticultural notes from the county experiment farms of Ohio.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 52–57. *5 pl.* 1920.—Plans for pruning, fertilizing, landscaping and management are given.—*R. C. Thomas.*

1720. BALLOU, F. H., AND I. P. LEWIS. **Culture and feeding of the apple orchard.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 43–48. *2 pl.* 1920.—The article includes a comparison of the value of fertilizers used respectively with the grass mulch and tillage systems of culture. —*R. C. Thomas.*

1721. BALLOU, F. H., AND I. P. LEWIS. **Pruning tests in young apple orchards.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 85–90. *5 pl.* 1920.—This is a report of tests made in orchards of County Experiment Farms in Ohio. Seven methods are discussed briefly, viz., (1) Light dormant pruning. (2) Heavy dormant pruning. (3) Light summer pruning. (4) Heavy summer pruning. (5) Light dormant pruning with summer clipping of new shoots. (6) Heavy dormant pruning with summer clipping of new shoots, and (7) No pruning.—*R. C. Thomas.*

1722. BALME, JUAN. **El olivo y su porvenir en Mexico.** [The olive and its future in Mexico.] Rev. Agric. [Mexico] 3: 379–383. *2 fig.* 1919.—History of olive culture in California and other parts of the new world, and the possibilities of growing the tree in Mexico.—*John A. Stevenson.*

1723. BECKWITH, CHARLES C. **The effect of certain nitrogenous and phosphatic fertilizers on the yield of cranberries.** Soil Sci. 8: 483–490. 1919.—As a result of one year's studies on the effect of fertilizers on the yield of cranberries, the optimum amount of a mixed fertilizer consisting of sodium nitrate, 75 pounds; dried blood, 75 pounds; rock phosphate, 300 pounds; potassium sulfate, 50 pounds, was found to be 800 pounds. A mixture of mineral and organic nitrogen did not prove superior to sodium nitrate alone. Calcium cyanamid and barium phosphate proved unsatisfactory sources of nitrogen and phosphorus respectively.—*W. J. Robbins.*

1724. BERNARD, CHARLES. **La culture du thé aux Indes néerlandaises.** [Tea-culture in the Dutch East Indies.] Rev. Gén. Sci. Purea et Appliquées 30: 17–18. 1919.—This paper, by the Director of the Tea-Experiment Station in Buitenzorg, Java, covering the industry indicated by the title, is of such conciseness as not to lend itself to further condensation into an abstract.—*G. J. Peirce.*

1725. BLAIR, W. S. **Orchard cultivation.** Fruit Growers' Assoc. Nova Scotia Ann. Rept. 55: 18–27. 1919.—Early plowed land contained 5.6 per cent more moisture in August than land plowed two weeks later. In another experiment sod land contained 5.9 per cent moisture in August while land cultivated six times and seeded to a cover crop on July 20 contained 14.1 per cent. Of the cover crops used crimson clover depleted the soil moisture least and millet most.—*Paul A. Murphy.*

1726. BOULGER, G. S. [Rev. of: BEDFORD, DUKE OF, AND SPENCER PICKERING. **Science and fruit growing: Being an account of the results obtained at the Woburn Experimental Fruit Farm since its foundation in 1894.** *xxii+351 p.* Macmillan & Co.: New York, 1919.] Jour. Botany 58: 28–29. 1920.

1727. BOYER, G. **Études sur la biologie et la culture des champignons superieurs.** [Biology and culture of mushrooms.] Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 233–344. *4 pl., 20 fig.* 1918.—See Bot. Absts. 5, Entry 1931.

1728. Cabrera, Teodoro. **La utilidad de los guayabos.** [Uses of the guava-trees.] [Revist. Agric. Com. y Trab. 2: 628. 1919.

1729. Call, L. E. **Director's report.** Kansas Agric. Exp. Sta. Ann. Rept. 1917-18. 69 p. 1918.—See Bot. Absts. 5, Entry 1466, 2024.

1730. Calvino, Mario. **Reseño general sobre la arboricultura frutal de Mexico.** [Fruit trees of Mexico.] Rev. Agric. [Mexico] 5: 34–42. *6 fig.* 1919.—Lists the fruits of Mexico both for the tropical and the temperate belts, giving uses and possibilities of development of each. Fruits belonging to the following genera are discussed: *Crataegus, Carasus, Persea, Juglans, Casimiroa, Diospyros, Lucuma, Citrus, Musa, Theobroma, Annona, Spondias, Carica, Achras, Psidium, Chrysophyllum, Mangifera, Cocos, Cudonia, Phoenix, Vitis,* and *Olea.*—*John A. Stevenson.*

1731. Condit, I. J. **Caprifigs and caprification.** Univ. California Agric. Exp. Sta. Bull. 319; 341–375. 1920.—Figs which drop may be of the Smyrna class, the fruits of which require caprification in order to set and remain on the tree; they may be of the caprifig class, the fruits of which drop unless inhabited by the fig insect; or they may be common figs which drop because of unsuitable climatic conditions. Varieties of caprifigs which consistently bear quantities of polleniferous figs year after year, should be discarded, as they are of no value in caprification. A list of commercially grown varieties is given.—*A. R. C. Haas.*

1732. Ducomet, M. V. **Par quel moyen peut-on assurer a l'obtenir la propriété des variétés nouvelles de plants cultivées.** [How can the ownership of new varieties of cultivated plants be assured to the owner.] Jour. Soc. Nation. Hortic. France 20: 120–121, 139–144, 173–177. June, July and August, 1919.—The writer calls attention to the fact that the originator of a new and worthy plant is not protected in his rights in the same way that an inventor or writer is. He thinks that a man who has spent years in developing a worthy plant should be protected by law so that no one else would be allowed to propagate and disseminate it without paying a royalty to the originator. The writer recommends for France:—(1) That an association of French plant breeders be formed.—(2) That one or more government establishments, open to the public, be instituted for the acceptance and preservation of new varieties.—(3) That committees of acceptance and control be appointed.—(4) That every request for entry be accompanied by a detailed description of the new variety; a supply of seeds, bulbs, roots, buds or grafts; as exact an account as possible of the parentage of the new form; and a promise to send periodically fresh supplies of seeds, roots, etc., and to permit visits to the plantations in the event of controversy.—(5) That the request for registration of the new variety be publicly announced.—(6) That in the case of annuals a provisional certificate be given after one year and a final certificate after not less than two years and that certificate in the case of perennials be granted in as short a time as the nature of each permits.—(7) That the certificate guarantee only the authenticity of the plants not their productivity or any other quality.—(8) That the certificate be revoked if the variety prove unstable or is shown not to be a novelty.—(9) That during the period of certification no sale of the variety be allowed without the authorization of the originator.—No recommendation is made as to the length of the period of protection for the originator. —*H. C. Thompson.*

1733. Ellenwood, C. W. **Bearing habits of the Delicious apple.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 27–28. *2 tables.* 1920.

1734. Enfer, V. **L'ensachage des fruits.** [Bagging fruits.] Rev. Hortic. 91: 294–295. June, 1919.—The enclosing of fruits in sacks has long been practiced as a protection against various insects and hail, and because fruits thus protected are improved in texture and size. Sacks of a size appropriate to the fruit to be enclosed are chosen, the deformed and excess fruits removed, and those remaining enclosed when they are the size of a small nut, or at least by June 15 before the egg-laying period of the codling moth. Small holes are cut near the bot-

toms of the sacks in order that air may be admitted and excess moisture drained out. The fruit may remain covered until harvested, but the more highly colored varieties should be gradually uncovered by cutting out parts of the sack about September 10. It may be removed entirely several days later, after the skin has hardened somewhat. Bits of paper should be left attached to the peduncles of the fruits, in order to prevent attacks by birds.—*E. J. Kraus.*

1735. ENFER, V. **Sélection des jeunes fruits. [The selection of young fruits.]** Rev. Hortic. 91: 333-334. August, 1919.—In spite of the fact that many fruit buds are removed by pruning or are destroyed by cold or unfavorable weather, still, more generally remain than can be matured into good fruits. It is advisable, therefore, to remove all deformed and small fruits as early in the season and as rapidly as possible. When the fruit spurs are close together the fruits from half of them should be removed entirely in order that there may be a crop the following year. Later, selection is to be made of those which are to be sacked. The number of fruits to be preserved on each tree will vary with the vigor of the tree and the final volume of the fruit when mature. If a variety is the more valuable because of its extraordinary size, very few fruits should be allowed to remain even on vigorous trees.—*E. J. Kraus.*

1736. FENZI, E. O. **Le culture ortive in Tripolitania. [Vegetable culture in Tripolitania.]** Bull. R. Soc. Toscana Orticult. 44: 105-109. 1919.—A discussion of the crops cultivated in this Italian colony.—*W. H. Chandler.*

1737. GINARTE, BENJAMIN MUÑOZ. **Algo más sobre el cultivo de la piña. [More about pineapple culture.]** Revist. Agric. Com. y Trab. 2: 592-593. *Fig. 1-2.* 1919.—The opinion of Rossi that the pineapple is a native of Brazil is recorded. The qualities of the fruits of different varieties of pineapple and closely related plants are described. A classification by Rossi is given.—*F. M. Blodgett.*

1738. GLADWIN, F. E. **A test of methods of pruning the Concord grape in the Chautauqua grape belt.** New York Agric. Exp. Sta. [Geneva] Bull. 464: 189-213. *10 pl.* 1919.—Experiments covering a period of eight years were conducted at Fredonia, N. Y. Seven methods of training were tested and early winter pruning compared with late winter pruning. So far as yield is concerned, the single-stem Kniffin, the Munson, and the Chautauqua methods of training proved about equal; while fruit from the high-renewal and two-stem Kniffin methods was smaller in quantity and poorer in quality. Considering all of the advantages and disadvantages of the several methods, the single-stem Kniffin outranked all other methods of training. On the whole, late winter pruning made a slightly better showing than early winter pruning; but the difference in yield, wood growth, and maturity of fruit was too slight to warrant the definite conclusion that either method of pruning is to be preferred to the other.—*F. C. Stewart.*

1739. GREEN, W. J. **Smudging to prevent frost.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 63. 1920.

1740. GRUEBER, CHARLES. **Annual report of the senior fruit inspector.** Tasmania Agric. and Stock Dept. Rept. 1918-19: 10-11. 1919.—Administrative report on enforcement of various regulations at the port of entry and departure. The "apples and pears standaridization act" was not complied with satisfactorily. Many growers preferred to ship ungraded stock and some such shipments sold as well as stock marked "Fancy."—Shipments from Hobart for the year were over one million cases of fresh fruit.—*D. Reddick.*

1741. HATTON, RONALD G. **Paradise apple stocks; their fruit and blossom described.** Jour. Roy. Hortic. Soc. 44: 89-94. *Fig. 20-33.* 1919.—The author lists nine types of dwarf apple stocks grown at the Wye College Fruit Experiment Station, England. These have been compared with a series of "free" or standard stocks and there appears to be no strict dividing line between the two series. Eight of the dwarf types have fruited and tabular description of the flowers and fruit are given.—*J. K. Shaw.*

1742. Haywood, A. H. **The rice bean (Phaseolus calcaratus) or so-called Jerusalem pea (P. trinervis).** Agric. Gaz. New South Wales 31: 289-290. *1 fig.* 1920.—Notes are given on the plant as a cover crop for bananas. Its use is recommended.—*L. R. Waldron.*

1743. Hodgson, R. W. **Pruning the navel oranges.** California Citrograph 5: 138, 169. 1920.

1744. Bonnet, G. **Les hybrides en 1919.** [The hybrids in 1919.] Rev. Vitic. 52: 53-59. 1920.—The oldest hybrids most resistant to drought are: Oberlins, Gaillard Number 2, Condere 202 × 75, 146 × 51, Seibel 1000, 2859, Bertille-Serve 450; those less resistant are: S. 2003, 2006, G. 194, 157, S. 2734, 880, C. 272 × 60. Two black grapes, B-S, 413 and C. 106 × 46, have grown and produced well. The new black direct producers are: Baco Number 1, B-S 872, 893, 1129, Malegue 829 × 6, M. 2049 × 3, S. 4121, 4643, 4636 and 5212. Among the white varieties are: C. 162 × 5, S. 2638, 4681, 4955, 4986, 5279, M. 1647 × 8, 1157 × 1, Baco 22A, B. 43 × 23. A certain number of these new varieties appear to be very promising. They are more resistant to fungous diseases than *Vinifera* varieties.—*L. Bonnet.*

1745. Houser, J. S. **Recent tests of materials to control San Jose scale.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 49-51. 1920.

1746. Howard, A., and G. L. C. **Report of the Imperial Economic Botanists.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 46-67. *Pl. 5 and 6.* 1919.—See Bot. Absts. 5, Entry 1159.

1747. Hyde, W. C. **Orchard cover-crop experiments on the Mountere Hills.** New Zealand Jour. Agric. 19: 364-365. *Fig. 1.* 1919.—See Bot. Absts. 5, Entry 1262.

1748. Jones, J. **Plant importations.** Report on the Agricultural Department, Dominica, 1918-19: 2-3. [Imp. Dept. Agric. Barbados, 1919.]—Notes are given on the following plants: Mexican apple (*Casimiroa edulis*), Rambutam (*Nephelium lappaceum*), *Poutaria suavis*, Jaboticaba (*Myrciaria cauliflora*), Brazil nut (*Bertholetia excelsa*), Sapucaia nut (*Lecythis Zabucajo*), Suwarri nut (*Caryocar nuciform*) and Chicle gum tree. Other plants under trial are Sarawak bean (*Dolichos Hosei*), from St. Lucia, and *Cytisus Palmensis*, *C. stenopetalus* and *C. pallidus*, plants used in the Canary Islands for forage purposes. Mention is also made of *Momordica cochin-chinensis*, the seeds of which contain an oil of remarkable drying properties.—*J. S. Dash.*

1749. Jones, J. **Plot experiments with orchard cultivation.** Report on the Agricultural Department, Dominica, 1918-19: 18-23. [Imperial Department of Agriculture, Barbados. 1919.]—The author treats in a full and interesting manner the difficulties encountered while carrying on manurial and other experiments with such permanent crops as cacao and limes. Many useful suggestions are given.—*J. S. Dash.*

1750. Kirby, R. S., and J. S. Martin. **A study of the formation and development of the flower beds of Jonathan and Grimes Golden in relation to different types (clover sod, blue grass sod, cover crop, and clean tillage) of soil management.** Proc. Iowa Acad. Sci. 25: 265-290. *Pl. 7.* 1920.—Experiments made at Council Bluffs, Iowa, indicate that flower buds of apple form earlier and in greater numbers where soil moisture is less, and that nitrogen added by clover sod induces earlier formation of flower buds. The flowers are differentiated during a period of about four weeks on each tree, at some time between July 1 and September 15, according to variety and location.—*H. S. Conard.*

1751. Kelley, W. P., and E. E. Thomas. **The effects of alkali on citrus trees.** California Agric. Exp. Sta. Bull. 318: 305-337. 1920.—The bulletin aims to enable citrus growers to recognize the effects of alkali, to appreciate the seriousness of alkali in citrus culture, to apprehend the relationships between irrigation and the accumulation of alkali, and to see that the application of certain fertilisers, especially nitrate of soda, may bear an important relation to the accumulation of alkali. The discussion is confined mainly to the effects of

excessive salt concentration. Alkali content of the soil may ultimately reach a harmful concentration where irrigation water is applied that contains only a relatively low concentration of alkali salts. The rate of salt accumulation varies in different soils, depending on (1) the composition of the water, (2) the amounts applied, and (3) the freedom with which it penetrates into the subsoil. There exists a close relationship between the composition of irrigation water and the accumulation of alkali salts, and the condition of the citrus trees.—*A. R. C. Haas.*

1752. LAFFER, H. E. **The pruning of the vine.** Agric. Gaz. New South Wales 31: 47-55, 121-126. *Fig. 5-13.* 1920. [Continued from: *Ibid.* 30: 808. 1919.]

1753. LARUE, P. **Taille du Pineau à Chablis.** [**Pruning the Chablis Pineau grape.**] Rev. Vitic. 52: 7-11. *2 fig.* 1920.

1754. LEWIS, C. I., A. E. MURNEEK, AND C. C. CATE. **Pear harvesting and storage investigations in Rogue River Valley.** (Second report.) Orgeon Agric. Exp. Sta. Bull. 162: 1-39. *Fig. 1-18.* 1919. Fruits of Bartlett pears increase gradually in size, but at an accelerated rate in volume, throughout the growing season, apparently independently of climatic or cultural conditions. A distinct correlation appears to exist between the degree of maturity of Bartlett pears and the resistance offered by the cortical and epidermal tissues to pressure as measured by the amount of pressure required to force into them a $\frac{7}{16}$ inch steel ball up to one half its diameter. There is no direct relationship between such resistance to pressure and the diameter of the fruit. Storage investigations showed that, in the case of Bartlett pears, the size of the fruit was not a factor in time of ripening or decay. Fruits picked during the middle or latter part of the season of development kept longer than those picked early, and were superior in quality, and those picked exceptionally late were superior both in keeping and eating qualities. No difference in rate of maturity in storage was noted when a change in temperature of 10° to 15°F. was registered, provided the same approximate percentage of humidity was maintained. In the case of Bosc pears it was determined that both relatively high temperature with low humidity and low temperature with high humidity were harmful to proper ripening, that fruit picked very early in the season must be allowed to ripen partially before being placed at low temperatures, and that at least two weeks should elapse before putting the fruit into cold storage, though this time may be decreased under conditions of higher humidity.—*E. J. Kraus.*

1755. LODIAN, L. **Strange things to eat.** Sci. Amer. 122: 302, 312, 314. *9 fig.* 1920.—A popular enumeration of seeds, bulbs and flowers used by cosmopolitan New York City for food, which are out of the ordinary for that region.—*Chas. H. Otis.*

1756. MACOUN, W. T. **The commercial varieties of apples of Canada and the United States.** Fruit Growers' Assoc. Nova Scotia Ann. Rept. 55: 119-137. 1919.

1757. MANARESI, A. **Sulla biologia fiorale del pesco. 2a nota.** [**On the floral biology of the peach. 2nd note.**] Staz. Sperim. Agrarie Italiane 52: 42-67. 1919.—A study of the structure of the flower, its various parts and functions in a large number of varieties. Statistical study of the size of the various types of buds in different varieties, of the shape of the flower as connected with the character and adherence of the stone; the classification of the varieties into two groups characterized by a campanulaceous perianth in one case and a rosaceous perianth in the other case. A study of the flowering period and its daily periodicity; the action of meteorological conditions upon the functions and longevity of the various floral parts; form and dimension of pollen, and its relation to varietal classification. Study of the germination of the pollen of seventy varieties, of the size of the pollen tube, its morphological characteristics and speed of germination when tested in solutions of the following sugars: lactose, saccharose, maltose, glucose, laevulose, and galactose in solutions ranging in concentrations from 5 to 30 per cent. Distinct differences were obtained with the different sugars, saccharose being the most generally useful in concentrations ranging from 10 to 20 per

cent; maltose in a concentration of 10 to 15 per cent may give results that approach and some times surpass those obtained with saccharose; lactose and glucose gave relatively good results only in concentrations varying from 5 to 15 per cent while galactose gave passable results at this concentration the optimum being between 5 and 10 per cent. Laevulose gave very poor results. Distinct differences were to be observed in the pollen tubes germinated in the different sugars, and in the different concentrations. Accidental differences were observed in some varieties in the position of the style with respect to the position of the anthers, and differences in the number of styles and ovules in the pistils. Anthesis was found to take place exclusively in day time, and mostly in the forenoon, the petals first expanding being the ones first touched by the sun. Cleistogamy was often observed in good seasons, and dehiscence took place mostly in the early forenoon under the direct guidance of the sun. Anthesis appears to follow a centrifugal path along the branch. The influence of the position and altitude of the tree and of grafting upon the time of flowering are also touched upon. A bibliography is appended.—*A. Bonazzi.*

1758. Marshall, Roy E. **Pruning fruit trees.** Virginia Polytech. Inst. Ext. Bull. 38. *37 p., 20 fig.* 1919.—A popular discussion of the training and pruning of apple, peach, pear, cherry, and plum trees with special emphasis on those phases of the subject of most practical importance in eastern United States.—*F. D. Fromme.*

1759. Martin, J. N., and L. E. Yocum. **A study of the pollen and pistils of apples in relation to the germination of the pollen.** Proc. Iowa Acad. Sci. 25: 391–410. *Fig. 165–166.* 1920. —The pollen of the five varieties of apples studied contains proteins or amino-acids, some pectin, and occasionally small amounts of sugars at the time of pollination. Pollen grains germinate in sugar solutions from pure water to 70 per cent, but most successfully at 2½ per cent. A temperature of 22°–25°C. was best. The stigma is papillate; pollen germinates when caught between the papillae. The styles contain much cane sugar at some distance below the stigma. No secretion was found on the stigma at the time favorable for pollination.—*H. S. Conard.*

1760. Matsushima, T. **Untersuchungen über die Wasseraufnahme bei abgeschnittenen Zweigen. [Investigation of the water-absorption of amputated branches.]** Jour. Coll. Sci. Imp. Univ. Tokyo 43¹: 1–27. 1919.—After an abstract of the literature of the subject, Matsushima considers the relations of water-absorption to the Japanese art of arranging bouquets, and reports the methods and results of his experiments. In these he used water, both tap and distilled, and dilute acid and alkaline solutions, branches or sprays cut in the air and others under water, and still others the cut ends of which were deliberately burned. His results, as summarized at the end of the paper, are that in twigs cut off in air the decrease in water-absorption is insignificant if the twigs have abundant wood, but that in plants with much slime, milk or gum it is considerable: that burning the cut ends is especially favorable in the slime, milk and gum carrying plants as thereby the stopping of the water-carrying vessels is prevented: and that acids, especially the organic acids, increase the water-absorption while alkalies decrease it in ordinary plants, whereas in milk, slime and gum containing twigs the reverse is true.—*G. J. Peirce.*

1761. Munn, M. T. **Spraying lawns with iron sulfate to eradicate dandelions.** New York Agric. Exp. Sta. [Geneva] Bull. 466: 21–59. *Pl. 1–6.* 1919.—Experiments made at Geneva, New York, demonstrate that dandelions (*Taraxacum officinale* and *T. erythrospermum*) may be eradicated from lawns at small expense and without material injury to the grass by spraying four or five times during the season with a solution prepared by dissolving 1.5 to 2 pounds of iron sulfate in one gallon of water. Spraying should be supplemented by the use of fertilisers and the application of grass seed in the spring and fall of each year. With proper management a lawn may be kept practically free from dandelions by spraying every third year. The cutting-out method of fighting dandelions is laborious and ineffective unless the greater part of the root is removed. A study of seed production in *Taraxacum officinale* shows it to be parthenogenetic.—*F. C. Stewart.*

1762. PELLETT, FRANK C. **American honey plants, together with those which are of special value to the beekeeper as sources of pollen.** *15 x 23 cm. 297 p., 155 illust.* American Bee Journal: Hamilton, Illinois, 1920.—The book is primarily an annotated and illustrated list of a very large number of plants that are of more or less interest to beekeepers. Each plant is listed in alphabetical order by some "common" name, but the Latin name is added in each case and a cross-referenced index makes it possible to find a given entry by either name. Names of states in the United States and of provinces in Canada are inserted in the alphabetical arrangement, each with a brief consideration of the honey-plants of that area. Many other names besides those of plants and regions find place in the list; under P is found a discussion of about seven pages on "Physiology of nectar secretion." The annotations are mainly with reference to the production of honey or pollen, but many facts of plant distribution are stated. Numerous quotations, with their sources are given. The geographical region considered is practically the United States, Alaska and Canada, rather than the whole of even North America. The illustrations are mostly reproductions of photographs. The book contains much to interest gardeners and plant-lovers generally, as well as beekeepers.—*B. E. Livingston.*

1763. PICKFORD, VERNE C. **Control of air conditions in lemon storage rooms.** California Citrograph 5: 139, 164. 1920.

1764. QUISUMBING Y ARGUELLES, E. **Studies of Philippine bananas.** Philippine Agric. Rev. 12²: 1-73. *50 pl.* 1919.

1765. RAVAZ, L. **Obtention des greffes-soudés. [Method of handling callused grape grafts.]** Prog. Agric. et Vitic. 74: 173-182. 1920.

1766. RAVAZ, L. **Plantation des bouturos soins speciano. [Planting of cuttings—special precautions.]** Prog. Agric. et Vitic. 74: 21-32. 1920.—In planting grape cuttings "in situ" it is recommended that only the cuttings from the base of canes be planted; to mound them to avoid injury by frost, or to stratify them in a reverse position and plant after roots have appeared. The vineyard should be carefully cultivated.—*L. Bonnet.*

1767. RAWES, A. N., AND F. J. CHITTENDEN. **Effect of grass on apple trees.** Jour. Roy. Hortic. Soc. 45: 116-119. 1919.—Twenty-five trees of five varieties on crab and Paradise stocks were grown at Wisley, England under continuous cultivation, under grass with a space around the tree 2 to 3 feet in diameter kept bare and stirred at intervals, and under a grass mulch. Growth and yield were largest where the trees were cultivated.—*J. K. Shaw.*

1768. RIVES, LOUIS. **Affinité des hybrides pour les porte-greffes. [Affinity of hybrids for resistant stocks.]** Prog. Agric. et Vitic. 74: 13-14. 1920.—The direct producers are generally very exigent in water and give good results on vigorous resistant stocks. The Vinifera Americans, 1202, the Aramon × Rupestris, the 93-5, show a sufficient affinity for them. The Rupestris St. George gives varying results. The author concludes that affinities must be studied experimentally in various soils and localities.—*L. Bonnet.*

1769. RIVIÈRE, C. **Le Jardin d'Essai d'Alger. [The Experimental Garden at Algiers.]** Rev. Hortic. 91: 340-342. Sept., 1919.

1770. RIVIÈRE, G. **De la progression de la maturation dans les poires a couteau. [Progression of ripening in table pears.]** Jour. Soc. Nation. Hortic. France 20: 306-307. Dec., 1919.—The author states that ripening of pears begins at the stem end and proceeds toward the calyx end. Analyses were made to determine the sugar content of different parts of the pear as it begins to ripen and it was found that the stem end section contained a larger percentage of sugar than the middle section and the latter more than the calyx end section. From this the author concludes that ripening progresses from the stem end toward the calyx end.—A table showing the percentage of sugar in three cross sections of three varieties of pears is given.—*H. C. Thompson.*

1771. Sanders, J. G., and L. H. Wible. **List of owners of commercial orchards and licensed nurserymen in Pennsylvania, including list of registered dealers in nursery stock.** Bull. Pennsylvania Dept. Agric. 1[6]: 1–56. 1918.

1772. Shamel, A. D. **Control of humidity conditions in lemon storage rooms.** California Citrograph 5: 137, 170. *3 fig.* 1920.

1773. Shamel, A. D. **Results of individual tree performance record studies with pruned and unpruned Marsh grapefruit trees.** California Citrograph 5: 248, 268. *4 fig.* 1920.—Experiments showed that heavy pruning of middle-aged vigorous grapefruit trees reduced the crop with no compensating benefits. The author recommends the training of young trees to proper form; the renewal by heavy pruning of old worn out trees; and the pruning out of dead brush and conflicting branches at any time. Aside from this he would not prune Marsh grapefruit trees.—*J. E. Coit.*

1774. Stuckey, H. P. **Work with Vitis rotundifolia, a species of muscadine grapes.** Georgia Agric. Exp. Sta. Bull. 133: 60–74. *4 pl. (colored), 8 fig.* 1920.—See Bot. Absts. 5, Entry 1668.

1775. Thayer, Paul. **Selecting nursery stock.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 58–62. *4 pl.* 1920.—Particular attention is called to the supreme merit of standard varieties and the importance of selecting clean, disease-free stock.—*R. C. Thomas.*

1776. Thayer, Paul. **The Bartlett plum.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 26. *1 pl.* 1920.—This variety combines beauty and utility and is recommended for semi-formal plantings.—*R. C. Thomas.*

1777. Thomas, P. H. **Annual report of the Assistant Fruit and Forestry Expert.** Tasmania Agric. and Stock Dept. Rept. 1918–19: 19–20. 1919.—Brief notes on the following: a fruit tree disease, caused by *Armillaria mellea*, can be prevented in early stages by cutting away all diseased tissue and painting over the wound with Bordeaux paste; a treatment of apples with nitrate-caustic soda spray did not have appreciable effect on fruit production or growth. Experiments are in progress with stocks for fruit trees, cold storage of fruit, etc.—*D. Reddick.*

1778. Tribolet, I. **Olives. I.** South African Jour. Indust. 2: 1160–1167. 1919.

1779. Tribolet, I. **Olives. II.** South African Jour. Indust. 3: 42–49. 1920.

1780. Truelle, A. **La vente des pommes de calville blanc, de Méran (Tyrol). [Marketing white Calville apples from Meran (Tyrol).]** Rev. Hortic. 91: 378–380. Nov., 1919.—Special methods of grading and packing are followed in marketing the fruit in order to utilize it to the best advantage and to derive the largest profits from its sale. The fruits are first graded into three classes. Class A contains perfect fruits only; Class B those which have slight defects; and Class C those which have more pronounced imperfections. These groups are again divided according to the form, beauty, and particularly the weight of the fruits. After grading the finest fruits are wrapped first in a white and then in a colored paper, and packed into boxes whose gross weight does not exceed 5 kilos. Usually such boxes contain from 12 to 20 fruits, though there may be as few as 9 or as many as 32. The less choice fruits are packed into cases which contain from 400 to 500 fruits arranged in 6 layers, with a gross weight of 55 to 60 kilos, and into half-cases which contain from 180 to 200 fruits arranged in 5 layers, with a gross weight of 25 to 30 kilos. There are also special cases for special purposes. The price received for the fruit varies with the quality and quantity available. Over a ten-year period, for the best fruits this has ranged from 10, to more than 50 cents a pound; very large individual specimens selling readily for 80 cents each. The inferior grades sell for less. —*E. J. Kraus.*

1781. Turney, A. G. **Report of the Horticulturist.** Province of New Brunswick Rept. on Agric. 1918: 86–109. 1919.

1782. TYSON, CHESTER J. **Report of the Pomologist.** Bull. Pennsylvania Dept. Agric. 1: 27-29. 1918.—Includes general remarks upon exporting, market conditions, prices, packing and marking bill, new plantings, and the future of apple-growing industry in Pennsylvania.—*C. R. Orton.*

1783. VERDIÉ, H. **Enquête sur les producteurs directs dans le Gers. [Inquiry on direct producers in the Gers.]** Rev. Vitic. 52: 78-19. 1920.—The direct producers giving the best results in that region are: Seibel 128, 138, 880, 1000, 1020, 2859, Condere 235-120, 272-60, 71-20, Mategue 829-6, 1100-2, 1157-1, Gaillard-Girerd 157, 194, Castel 1028, Bertille-Seyve 450, Baco 22A. These hybrids vary in regard to their adaptation to soils and their resistance to fungous diseases.—*L. O. Bonnet.*

1784. WARD, J. M. **Annual report of the fruit and forestry expert.** Tasmania Agric. and Stock Dept. Rept. 1918-19: 16-19. 1919.—Administrative report of work among fruit growers in connection with enforcement of grading and packing laws and the like.—Apple trees are found to do very much better when worked on seedling stock than when on root-graft stock. Jonathan, Fameuse, Dunn's, King David and Alfriston seem to do well on root-graft stock.—*D. Reddick.*

1785. WEBBER, HERBERT JOHN. **Selection of stocks in citrus propagation.** California Agric. Exp. Sta. Bull. 317: 269-301. 1920.—The influence of the character of the stock on the variation in yield of trees, forms the basis of the bulletin, although other important factors are considered. Differences in size of nursery trees of transplanting age is largely due to the fact that the seedling root-stocks on which the trees are budded are of different types, possessing inherent characters that react differently on the growing buds. Recommends that all small seedlings in the seed bed and nursery, regardless of what has caused their dwarfness, be discarded.—*A. R. C. Haas.*

1786. WEIDNER, A. I. **Report of committee on fruit and fruit culture.** Bull. Pennsylvania Dept. Agric. 1: 22-24. 1918.—Some general remarks upon the condition of orchard fruits in Pennsylvania during the year 1917. Includes brief notes on San Jose scale, dusting, cultivation and fertilization, pruning, borers and spraying.—*C. R. Orton.*

1787. WHITEHOUSE, W. E. **Cold storage for Iowa apples. (Third progress report.)** Iowa Agric. Exp. Sta. Bull. 192. 181-216. *14 fig.* 1919.—Methods of control of disease of cold stored apples are set forth. A study was also made of the factors relating to the control of common diseases of the apple in cold storage, such as temperature, humidity, maturity of fruit, size of apples, wrapping paper used in packing and rate of cooling.—*Florence Willey.*

1788. WOGLUM, R. S. **Is it safe to fumigate while trees are in bloom?** California Citrograph 5: 190. *Fig. 1.* 1920.—Experiments show that citrus blossoms and blossom buds are more resistant to hydrocyanic acid gas than tender leaves and shoots. It is suggested that this may be due to higher concentration of reducing sugars in the former. Ordinary fumigation if carefully done will not injure the bloom.—*J. E. Coit.*

1789. YOUNG, FLOYD D. **Rate of increase in temperature with altitude during frosty nights in orange groves in southern California.** California Citrograph 5: 136, 160. *3 fig.* 1920.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

1790. ANONYMOUS. **Spring-flowering stocks tried at Wisley, 1916-17.** Jour. Roy. Hortic. Soc. 44: 117-122. 1919.—This is a report of trial of 180 varieties of spring flowering stocks at Wisley, England. A classification with brief descriptive notes is given.—*J. K. Shaw.*

1791. ANONYMOUS. **Oriental poppies at Wisley, 1917.** Jour. Roy. Hortic. Soc. 45: 120-125. 1919.—Report is made of the trials of 80 stocks of oriental poppies at Wisley, England, together with a classification and brief description and the awards of the Floral Committee.—*J. K. Shaw.*

1792. Anonymous. [Rev. of: Farrer, Reginald. **The English rock-garden.** *2 vol., 4to, lxiv, 504+viii, 524, 102 pl.* T. C. & E. C. Jack: London and Edinburgh.] Jour. Botany 57: 354-357. 1919.—The plants concerned are treated at considerable length in part from a botanist's standpoint, and the nomenclature is discussed.—*K. M. Wiegand.*

1793. B, D. **Fougères utiles.** [Useful ferns.] Rev. Hortic. 91: 330-331. Aug., 1919.—In addition to the specific mention of certain ferns enumerated by Prince Bonaparte (in: Notes Pteridologiques, Fasc. VII, p. 19, October, 1918), several others of medicinal or decorative value are listed.—*E. J. Kraus.*

1794. Bellair, G. **Comment economiser. Note sur le Verbena venosa.** [Economic comment. Note on Verbena venosa.] Rev. Hortic. 91: 387-388. *Fig. 119.* December, 1919.—Although this plant was introduced from La Plata in 1830, it is still grown but little as an ornamental because of the uncertainty connected with the germination of the seeds. In order to obviate this difficulty various methods of seed treatment were tested. Good results were secured from the following methods: (1) Immersion in water at 100°C. for 60 seconds; (2) immersion in water at 55°C. for 5 minutes; (3) immersion in a 2/1000 solution of nitrate of soda for 48 hours; (4) immersion in a 2/1000 solution of sulfate of ammonia for 48 hours; (5) stratification for 5 months. Poor results followed the following methods: (1) immersion in water at 70°C. for 4 minutes; (2) immersion in a 5/1000 solution of sodium nitrate for 48 hours; (3) immersion in a 5/1000 dilution of wood ashes, (4) immersion for 48 hours in pure water, though this latter result was fairly good. With the exception of the hot water treatments, the seeds were bathed in the solution indicated, rather than immersed in them. The stratified seeds, sown in March, germinated rapidly and completely. Seedlings may be carried over winter or grown in the spring and planted out of doors from the middle to the end of May.—*E. J. Kraus.*

1795. Berthault, P. **La réorganisation du Jardin d'Essais du Hamma.** [The reorganization of the Experimental Garden at Hamma.] Rev. Hortic. 91: 292-294. *Fig. 92-93.* June, 1919.—The experimental garden established in 1832, was later (1867) taken over by the Algerian Company with the three-fold view of making it a public park, a garden for scientific investigations, and a center for the introduction of exotics as well as for the propagation and distribution of indigenous plants. In 1913 the government again took possession of it and has declared its intention of maintaining it for these same purposes. Much has already been done in the way of removing the Garden from the state of neglect into which it had fallen, and it is confidently expected that it will soon assume high rank as a laboratory for various phytological investigations.—*E. J. Kraus.*

1796. Blot, F. **Corbeilles de chrysanthèmes.** [Beds of chrysanthemums.] Rev. Hortic. 91: 355-356. *Fig. 109.* Oct., 1919.—The chrysanthemum is preëminent among autumn flowers. Many types, forms and colors are available. Cutting prepared during the early part of March or the early part of April, or even the end of April for the varieties to be used as borders, should be cut back several times during the summer in order to secure stocky, bushy plants. Some of the single flowered varieties are especially desirable as budding plants. A classified list of more than forty varieties is given.—*E. J. Kraus.*

1797. Bois, D. **La rose "Los Angeles."** [The rose, "Los Angeles."] Rev. Hortic. 91: 296. *1 pl. (colored).* June, 1919.—This rose, exhibited by Howard and Smith of Los Angeles, California, at Bagatelle, where it received a gold medal, is the result of a cross between Lyon Rose (Pernetiana) and Madame Segond-Weber (hybrid tea). It much resembles the former in bud, flower, and color, and is said to be more hardy, more floriferous and less subject to fungous diseases.—*E. J. Kraus.*

1798. Bontrager, W. E. **What shade and ornamental trees shall we plant?** Monthly Bull. Ohio Agric. Exp. Sta. 5: 35-41. *5 pl.* 1920.—A discussion is given of the relative merits of types most suitable for lawn and shade planting, including those which will survive unfav-

orable conditions occasioned by gas, smoke and restricted areas, also with reference to distinctly ornamental species. Directions for the care and planting of young trees are outlined. —*R. C. Thomas.*

1799. BRODIE, IAN. **Seedling daffodils selected to grow on at Brodie Castle.** Jour. Roy. Hortic. Soc. 45: 113–155. 1919.

1800. BROOKS, A. J. **Work in the gardens and observations on plants.** Report on the Agricultural Department, St. Lucia, 1917–18: 1–5. [Imp. Dept. Agric., Barbados.] 1918.—Contains a list of economic and ornamental plants introduced. Notes are also given on several plants which are under trial. These include: hybrid hibisci, dracaenas, ixoras, bougainvilleas, *Swietenia mahogani*, *S. macrophylla*, *Carum copticum* and *Hyoscyamus muticus*. —*J. S. Dash.*

1801. BURNHAM, STEWART H. **Commercial fern gathering.** Amer. Fern Jour. 9: 88–93. 1919.—The author gives accounts of the commercial gathering of ferns, especially the shield fern, in Vermont. It seems that the ferns are bearing up under the strain of annual pickings, but it is hoped that some one with the opportunity will make accurate observations of the real effect of commercial picking.—*F. C. Anderson.*

1802. CLUTE, WILLARD N. **An unknown honeysuckle.** Amer. Bot. 26: 17. *Fig. 1.* 1920. —The plant sent out by the Foreign Seed and Plant Introduction Division of the U. S. Bureau of Plant Industry as No. 39697 from Nanking, China, collected by JOSEPH BAILLIE has flowered at Joliet, but the Division was unable to supply the name. [This plant has since been named *Lonicera Maackii* var. *pedocarpa* by DR. C. S. SARGENT.]—*W. N. Clute.*

1803. CLUTE, WILLARD N. [Editorial.] Amer. Bot. 26: 34. 1920.—Attention called to variations of commercial importance or of unusual interest in the writer's grounds. Red-leaved peaches, red forms of *Rubdeckia hirta*, a *Podophyllum* with multiple fruits, single-leaved locust, and various giant races mentioned.—*W. N. Clute.*

1804. CONSTANTIN, L. **L'Epiphora de Pobeguin de Finet (Epiphora Pobeguini).** Rev. Hortic. 91: 398–399. *1 pl. (colored).* Dec., 1919.—This species is an introduction from the Nenkan plateau, French Guinea. The plants are small, entirely epiphytic, and should be kept at a temperature of 18° to 22°C. throughout the year. In its native habitat it blooms in February or March, but certain plants which were brought into the greenhouses showed a progressive modification of the time of flowering as follows: June 14, 1910; September 31, 1912, and October 15, 1913.—*E. J. Kraus.*

1805. CRAWFORD, MRS. WM. **My experience with the peony.** Flower Grower 7: 24–25. 1920.—Observations on the cultivation and propagation of the peony.—*W. N. Clute.*

1806. CUMMINGS, ALEX., JR. **Hardy roses for the garden.** Gard. Chron. Amer. 24: 135. 1920.—Methods of cultivating and pruning described. [See also next following Entry, 1807.] —*W. N. Clute.*

1807. CUMMINGS, ALEX., JR. **Hardy roses for the garden.** Gard. Chron. Amer. 24: 94–96. 1920.—Garden roses considered as tea roses, hybrid teas, dwarf polyantha or baby ramblers, and pernetianas. A list of 14 new or comparatively new roses is given. [See also next preceding Entry, 1806.]—*W. N. Clute.*

1808. CUSHMAN, L. B. **Aegopodia podagraria variegata.** Amer. Bot. 26: 13–14. 1920.—This plant identified as a familiar form with variegated leaves in old gardens.—*W. N. Clute.*

1809. DAVEAU, J. **Ficus Saussureana et F. eriobotryoides Kunth et Bouché.** Rev. Hortic. 91: 389. Dec., 1919.—In 1840 A. P. DE CANDOLLE described *Ficus Saussureana*, basing his description upon a specimen then known as a *Galactodendron*, growing in the greenhouses of

Th. de Saussure, at Geneva. Later, in 1846, Kunth and Bouché described *Ficus eriobotryoides*. The descriptions of these two species are almost identical except that in the former species the petiole is said to be hirsute, in the latter, glabrous. In the Botanic Garden at Montpellier is a tree, also listed under the name of *Galactodendron*, but in reality it is a *Ficus* and corresponds to the descriptions of both of the foregoing species, since the petioles are at first hirsute, but gradually become more nearly glabrous, and finally completely so the second year. It is practically certain that the two species are synonymous and therefore the name assigned by de Candolle should be retained. The tree is a beautiful one and should find a place among collections of exotics.—*E. J. Kraus.*

1810. Denis, F. **Quelques iris nouveaux.** [**Some new irises.**] Rev. Hortic. **91**: 362. Oct., 1919.—A number of new varieties have been obtained during the past several years by hybridizing various species or by crossing forms which in themselves are hybrids. The variety John Wister is a valuable hybrid between *I. aurea* and *I. fulvala*. The latter, itself a hybrid between *I. fulva* and *I. hexagona Lamancei*, is intermediate in flower color and is self fertile. Hybrids somewhat lacking in vigor have been obtained between *I. Ciengialti* and *I. tectorum*, and between *I. Edina* and *I. tectorum*. The floral characters of the seedlings are intermediate for the most part. It is possible, also, to secure plants by hybridizing *I. tectorum* and *I. pallida dalmatica*, but no seeds are secured when the former is crossed with any variety from the groups *germanica neglecta, amoena*. The name *Iris filifolia* is applied to two distinct forms. The one commonly listed in floral catalogues is really an early flowering vigorous form of *Xiphium*. The other is the true *I. filifolia Boissier*, and it is found but rarely in various collections. The two species *I. Xiphium* and *I. filifolia* have been successfully hybridized—the resultant seedlings are intermediate in the color of the flower and the length of the tube.—*E. J. Kraus.*

1811. Hirscht, Karl. **Epiphytische Kakteen im Zimmergarten** [**Epiphytic cacti in window gardens.**] Monatsschr. Kakteenkunde **29**: 74-80. 1919.—A popular account is given of species suitable for window gardens and hints as to successful culture.—*A. S. Hitchcock.*

1812. Jackson, T. P. **Plant importations.** Report on the Agricultural Department, Antigua, 1917-18, 4-5. [Imp. Dept. Agric., Barbados, 1919.]—Interesting notes are given on trials with certain new plants at the Botanic Station, Antigua, notably the "Guada" bean (gourd), *Trichosanthes anguina*, useful as a vegetable, and several grasses.—*J. S. Dash.*

1813. Jacob, J. **Freesias and Lachenalias.** Jour. Roy. Hortic. Soc. **45**: 29-38. 1919.—These two plants were introduced into England from South Africa more than a hundred years ago and have recently been the object of renewed interest. Discussions of cultural methods are given and a list of varieties to which awards have been given by the Royal Horticultural Society.—*J. K. Shaw.*

1814. Jarmillo, P. J., and F. J. Chittenden. **On double stocks.** Jour. Roy. Hortic. Soc. **44**: 74-82. *Fig. 22, 23.* 1919.—Selecting the most vigorous seedlings gave a higher percentage of double stocks than were secured from selection of medium and weak seedlings. Such selection appears to have practical value in securing a high percentage of double flowering plants.—*J. K. Shaw.*

1815. Jahandiez, E. **Mesembryanthemum a formes étranges.** [**Mesembryanthemums of unusual form.**] Rev. Hortic. **91**: 372-374. *Fig. 112-113.* Nov., 1919.—Many species of this genus are especially unsuitable for growing in the open air in the more southern regions, where they are able to accommodate themselves to conditions of dryness, poor soil and salt air. It is possible to make excellent borders by using several species of varying height and flower color which ranges from violet to red, orange-red, and yellow. *M. acinaciforme* L., having broad violet flowers and *M. edule* L. which has large white or yellow flowers have become naturalized in southern France. *M. Bolusii* Hook. fil. from South Africa is one of the more striking species because of the close resemblance of its leaves to pebbles. Two related

species *M. simuland* Marloth and *M. testiculatum* Jacq. which has white, glaucous leaves, are equally remarkable. *M. pseudotruncatellum* Berger, has its leaves reduced to flattened balls, while those of *M. concinnum* N. E. Brown, from Damaraland, are covered with small, white tubercles. The leaves of *M. tigrinum* are marked with white and are bordered with long hairs, whereas those of *M. felinum* Haw are denticulate. *M. digitatum* Ait. resembles a very large finger, and *M. Barklyi* N. E. Brown is eaten by animals because of the large leaves which are filled with a watery sap. There are three native European species, *M. angulatum* Thunb., *M. cordifolium* L. and *M. crystallinum*, the leaves from all of which may be used in the same way as is spinach.—*E. J. Kraus.*

1816. LANTES, ADELAIDE. **El alamo.** [**The pipal tree.**] Revist. Agric. Com. y Trab. 2: 612-613. *3 fig.* 1919.—It is pointed out that the pipal tree (*Ficus religiosa*) is undesirable for common planting in parks and along roads. Its roots injure cement work, the leaves fall continuously, the fruits fall in quantities, and the trees are favorite retreats of birds. Other trees are mentioned which are preferred.—*F. M. Blodgett.*

1817. MANRIN, G. **Support rotatif pour plantes d'appartement.** [**A rotary support for house plants.**] Rev. Hortic. 91: 331. *Fig. 102-103.* August, 1919.—A brief description and working drawings are given.—*E. J. Kraus.*

1818. MARIE-VICTORIN, FR. DES E. C. **Le "Micrampelis lobata." "Une Plante lance-torpilles."** [**Micrampelis lobata (Michx.) Greene.**] Naturaliste Canadien 46: 172-174. Feb., 1920.—A graphic popular sketch of an interesting cucurbitaceous plant used for veranda decoration, found growing native in fertile soil along water courses in southern Canada.—*A. H. MacKay.*

1819. MEYER, RUD. **Kulturregeln aus alter Zeit.** [**Culture rules of ancient times.**] Monatsschr. Kakteenkunde 29: 37-41. 1919.—In this chapter, which is a continuation from the volume for 1917, page 120, are discussed the choice, packing, and shipping of cactus specimens.—*A. S. Hitchcock.*

1820. MILLARD, ALBERT. **Natural effects in landscape work.** Gard. Chron. Amer. 24: 103. 1920.—Numerous plants named for use in the natural style of planting.—*W. N. Clute.*

1821. MOREL, F. **Le clematis montana et ses dérivés.** [**Clematis montana and its derivatives.**] Rev. Hortic. 91: 358-360. *Fig. 110.* 1919.—The hybrid offspring of *C. montana grandiflora* and *C. montana rubens* were intermediate in color of flower, and generally more vigorous than the red form. When the former species was crossed with *C. repens*, individuals were secured which both preceded and followed the parent varieties in period of flowering, and possessed flowers which were larger than those of *repens* and of greater consistency than those of *grandiflora*. By careful selection, it was possible to interhybridize some of the latest appearing flowers of *C. repens* with some of the earliest flowers produced during the second period of bloom of *C. montana rubens*. From these crosses plants of unusual vigor and substance, bearing flowers of large size, good form and of various shades of rose or with red pencilings, were secured. A succession of blossoms may be secured by growing the following varieties: April—*C. montana rubens*; May—*C. montana grandiflora*, then *C. repente-montana rubens* with variously colored flowers, and finally *C. repente-montana grandiflora* with white flowers; June—*C. repens*; July and August—*C. montana rubens* and *C. repente-montana rubens* commence at this time a second period of flowering which may be prolonged into September and October. It may be possible to select a free-flowering, everblooming race from among the individuals disposed to flower more than a single time during the year.—*E. J. Kraus.*

1822. MOTTET, S. **Les leucanthèmes.** [**The leucanthemums.**] Rev. Hortic. 91: 312-313. *1 pl.* July, 1919.—It seems most probable that *L. lacustre Brot.* and *L. maximum D. C.* have contributed principally in the development of the large-flowered marguerites or Shasta

daisies, though it is probable that several other species have been concerned also. Although these large flowered forms were first introduced into Europe from America in 1902 or 1903, little is known definitely concerning their origin. The "Shasta Daisy" of Luther Burbank is thought to have been derived by a vigorous selection from the seedlings of *Chrysanthemum leucanthemum* crossed with an American species; this progeny in turn having been crossed with *C. nipponicum*, a Japanese species. Whatever may have been the origin of the various large flowered forms, it is certain that great variation now exists, and they are among the most generally useful decorative plants.—*E. J. Kraus.*

1823. Mottet, S. **Paederia tomentosa.** Rev. Hortic. 91: 298–300. *Fig. 95.* June, 1919. —This species was first introduced into Europe from China in 1806, and again in 1907, through seeds collected by E. H. Wilson for the Arnold Arboretum. It is recommended as a suitable covering for walls and trellises. A description and synonymy are given.—*E. K. Kraus.*

1824. Mottet, S. **Un rhododendron à fleurs jaunes. (R. campylocarpum.)** [A yellow flowered rhododendron.] Rev. Hortic. 91: 328–329. *1 pl.* August, 1919.—This species was collected by Hooker in Himalaya and introduced into England in 1856. Though it has been overlooked for a long time, there is little doubt that it is really a desirable, hardy form with persistent foliage and clear yellow flowers. It should serve, also, as valuable material for crossing with other forms. A detailed description of the species is given. Another yellow flowered species *Rhododendron lutescens* Franch, is mentioned as having been recently introduced from China by Wilson.—*E. J. Kraus.*

1825. Mottet, S. **Nouveaux oeillets remontants grandiflores.** [New large flowers, everblooming carnations.] Rev. Hortic. 91: 360–361. *1 pl. (colored).* Oct., 1919.—Attention is directed to seven varieties of carnations which represent the progress made in the last several years in breeding for flowers of large size and special colors. Although perpetual blooming carnations have been known since about 1845, it was not until near the end of the last century that the large flowered forms appeared, several varieties having been exhibited in 1900. New varieties have been introduced with considerable rapidity since that time. Most of these varieties may be placed in one of five or six type classes, each of which possesses distinctive characters of stem, foliage and flower. Intercrossing between the classes has been frequent, however, so that as a result several of the various types may be represented among any particular lot of seedlings.—*E. J. Kraus.*

1826. Mottet, S. **Un nouveau chamaecyparis (Ch. formosensis).** [A new chamaecyparis.] Rev. Hortic. 91: 342–344. *Fig. 105.* Sept., 1919.—The two Japanese species, *Ch. obtusa* Sieb. and Zucc. and *Ch. pisifera* Sieb. and Zucc., together with *Ch. sphaeroidea* Spach have produced many varieties commonly known under the name *Retinospora.* Two other forms are known from North America, namely *Ch. nutkaensis* Spach. and *Ch. Lawsonia*, Parlat. Each of these has given rise to several varieties. To this list of species should be added *Ch.* formosensis Matsum. which, on the island of Formosa, is said to attain a great size, one specimen having measured 22 meters in circumference at the base. The species was described by Matsumura in the Botanical Magazine for 1901. Seeds were introduced into England in 1911. It is highly recommended as a decorative tree, since the branches are as light and graceful as certain ferns, and they assume an attractive, bronze tint at the beginning of winter. Young trees are not entirely hardy in the vicinity of Verrières, though this defect may be overcome when the trees have grown older. The species may be propagated by grafting or from seeds. —*E. J. Kraus.*

1827. Mottet, S. **Digitale hybride de Lutz.** [The Lutz digitalis hybrid.] Rev. Hortic. 91: 396–397. Dec., 1919.—From seeds of an apparently spontaneous hybrid between *Digitalis purpurea* and *D. lutea*, the following types of plants were obtained: (1) Flowers clear chamois, spotted, foliage very downy. (2) Flowers purple, stems brown, and foliage smooth. (3) Flowers yellow-white, spotted.—Seeds were secured from plants of the first two types. From the first, five plants were obtained, three of which produced purple flowers and two chamois

flowers. From the second, 37 plants were obtained, but only five of them were sufficiently sturdy to bloom; all bore chamois, spotted flowers. One of the plants of the latter type was then chosen for seed production, but was not isolated, though the plants which produced purple flowers were destroyed. From this plant 300 individuals were secured. Of these, 13 produced purple flowers, the remainder yellow flowers. A few of the plants were weak. The variety probably will prove to be of value as an ornamental. Another hybrid between *Digitalis purpurea* and *D. ambigua* is more or less sterile and can not be propagated with sufficient ease to make it of horticultural importance.—*E. J. Kraus.*

1828. PEREZ, G. V. **Vitalité des racines de Bougainvillea. [Vitality of the roots of Bougainvilleas.]** Rev. Hortic. 91: 380. Nov., 1919.—Cuttings of this plant, put out in 1916, although they have not produced roots, are still alive and have not decayed. Small pieces of roots which were split lengthwise are also well preserved. Ordinary cuttings of conifers are preserved an equally long time in the open air, those of *Juniperus Cedrus* may not start roots for more than a year after they are planted out.—*E. J. Kraus.*

1829. PINELLE, A. **Robinia Kelseyi Hort.** Rev. Hortic. 91: 339. *Fig. 104.* Sept., 1919. —It is still uncertain whether this form is a true species of a hybrid between *R. hispida* and *R. pseudoacacia.* It is a shrub or small tree and bears a superficial resemblance to both forms. The flowers are pink and appear earlier in the season than those of either of the species mentioned. It is said to have arisen spontaneously in the nursery of a MR. KELSEY, of Boston, from seeds secured in the southern Alleghany Mountains. It is readily propagated by grafting on *R. pseudoacacia*, but it is unknown whether it will reproduce true to type from seed.—*E. J. Kraus.*

1830. POLE-EVANS, I. B. **Our aloes. Their history, distribution and cultivation.** Jour. Bot. Soc. South Africa 5: 11-16. *Pl. 2-3.* 1919.—Aloe rockeries and gardens are becoming fashionable in South Africa as they did in Holland and Britain at the beginning and in the middle of the eighteenth century. There are many aloes of reputed South African origin which have been under cultivation in Holland and England for at least one or two centuries, but which today are unknown in South Africa. The first to be cultivated in European gardens was *A. succotrina* Lam.—*E. P. Phillips.*

1831. QUEHL, L. **Auswahl der Arten zu einer Kleinen Kakteensammlung. [Choice of species for a small cactus collection.]** Monatsschr. Kakteenkunde 29: 54-55. 1919.

1832. RAGIONIERI, ATTILIO. **Un bel problema per i biologi: Sulla comparsa dell'odore nel fiore delle "Rosseline di Firenze" (Ranunculus asiaticus var.). [A good problem for biologists: on the appearance of odor in the flowers of the Florentine "rosseline" (Ranunculus asiaticus).]** Bull. R. Soc. Toscana Orticult. 44: 87-94. 1919.—He reports an experience with *Ranunculus asiaticus*, that had a marked rose odor not characteristic of the variety. Seedlings resulting from selfing the flowers of this plant showed this odor to a reduced extent. The strain had been grown on the same land since 1844 producing both vegetatively and as seedlings. He thinks that there was no chance for the odor to have been introduced by crossing with another variety, and that it is the reappearance of an ancestral character.—*W. H. Chandler.*

1833. RICCOBONO, VINCENZO. **La prima fioritura in Europa del Pilocereus Dautwitzii Fr. A. Haage. [The first flowering in Europe of Pilocereus dautwitzii Fr. A. Haage.]** Bull. R. Soc. Toscana Orticultura 44: 94-96. 1919.—Description of *Pilocereus dautwitzii*, introduced into Italy from northern Peru. Observations on its behavior.—*W. H. Chandler.*

1834. RINGELMANN, M. **Murs garnis de Lierre. [Ivy-covered walls.]** Rev. Hortic. 91: 363. *Fig. 111.* Oct., 1919.—It is believed by many that climbing plants, especially English ivy, are destructive to the walls upon which they grow. As a matter of fact, if young plants of English ivy are originally planted about 1½ or 2 feet from the base of the wall, when they

have grown and covered it the overlapping leaves will tend to shed water and also aid in keeping out the cold. The clinging rootlets, stem and branches of this vine aid in holding together the pieces of which the wall is constructed, rather than forcing them apart. Many other vines, however, which lose their leaves in winter, actually do tend to hold moisture against the wall that supports them.—*E. J. Kraus.*

1835. Sheward, T. **The dracenas.** Gard. Chron. Amer. 23: 61. *1 fig.* 1920.

1836. Smith, Arthur. **Twelve most desirable shrubs for gardens.** Gard. Chron. Amer. 24: 141. 1920.

1837. Smith, Arthur. **A lesson on seed sowing and germination.** Gard. Chron. Amer. 24: 108–110. 1920.

1838. Sturtevant, Robert Swan. **The garden plus irises.** Gard. Chron. Amer. 24: 97–98. *Fig. 2.* 1920.—Mention of various named varieties for garden planting.—*W. N. Clute.*

1839. Van den Heede, A. **Une superbe plante annuelle. [A superb annual plant.]** Rev. Hortic. 91: 393. Dec., 1919.—*Salpiglossis sinuata* Ruiz and Pavon, also known as *S. stramínea* Hooker, *S. atropurpurae* Graham, *S. picta* Sweet, *S. Barclayana* Sweet, *S. hybrida* Hort. and *S. variabilis* Hort., is a native of Chili and was introduced into Europe about 1830. Several other Chilian species, *S. fulva*, *S. integrifolis*, *S. intermedia*, and *S. linearis* were also introduced at about the same period, but these, together with *S. sinuata coccinea* and *S. stramínea picta* have disappeared from cultivation, so that at the present time *S. sinuata* and its dwarf variety alone persist. The plants are readily grown out of doors and the flowers possess a wide range of harmonious colors.—*E. J. Kraus.*

1840. Von Oven, F. W. **Perpetuating our native flora.** Amer. Bot. 26: 24–27. 1910.—The great individual differences that exist in the botanical species are pointed out and the proposal made that the best of these should be selected and propagated. The writer is a nurseryman and will undertake to grow variations that may be called to his attention.—*W. N. Clute.*

1841. Vorwerk, W. **Beitrag zur Kultur der Asclepiadaceae-Gattungen Trichocaulon und Hoodia. [Contribution to the culture of the asclepiad genera Trichocaulon and Hoodia.]** Monatsschr. Kakteenkunde 29: 41. 1919.—This includes remarks upon the cultivation of *T. keetmanshopense* and *H. Currori*.—*A. S. Hitchcock.*

1842. Weingart, W. **Aussaat von Cereus formosus S.-D. [Seed of Cereus formosus.]** Monatsschr. Kakteenkunde 29: 105. 1919.—Seed of *C. formosus* obtained by Haage and Schmidt from Los Angeles gave four forms: *C. formosus monstruosus*, *C. variabilis* Pf. (*C. Pitahaya* DC.), *C. formosus*, *C. obtusus*.—*A. S. Hitchcock.*

1843. Whitten, James. **The public parks of Glasgow.** Jour. Roy. Hortic. Soc. 45: 39–55. 1919.

1844. Williams, W. L. **The beet sugar industry.** Jour. Dept. Agric. Victoria 17: 722–730. 1919. *Ibid.* 17: 15–24, 65–74. 1920.—Sugar beet growing in Victoria is discussed.—*J. J. Skinner.*

VEGETABLE CULTURE

1845. Anonymous. **Runner beans at Wisley, 1918.** Jour. Roy. Hortic. Soc. 44: 95–100. 1919.—Report is made on sixty varieties of *Phaseolus multiflorus*, giving recommendations of the judging committee and a classification and description of the varieties.—*J. K. Shaw.*

1846. Anonymous. **Climbing French beans, 1918.** Jour. Roy. Hortic. Soc. 44: 101–110. 1919.—A report on seventy-nine climbing varieties of *Phaseolus vulgaris* with recommendations of the Vegetable Committee concerning their value. A classification with description of varieties is given.—*J. K. Shaw.*

1847. ANONYMOUS. **Vegetable marrows at Wisley, 1918.** Jour. Roy. Hortic. Soc. **44**: 114-116. 1919.—Tests of fifty-seven stocks of vegetable marrows, at Wisley, England, are reported, with the awards of the judges and brief discriptions of the different varieties.—*J. K. Shaw.*

1848. ANONYMOUS. **Leeks tried at Wisley, 1917-18.** Jour. Roy. Hortic. Soc. **44**: 111-113. 1919.—Brief description of 31 varieties of leeks are given with brief notes on cultural method and the awards of the judging committee.—*J. K. Shaw.*

1849. ANONYMOUS. **Brussels sprouts at Wisley, 1918.** Jour. Roy. Hortic. Soc. **45**: 125-127. 1919.—Brief descriptions of 64 stocks of Brussels sprouts and the awards of the Fruit and Vegetable Committee are given.—*J. K. Shaw.*

1850. ANONYMOUS. **Carrots at Wisley, 1918.** Jour. Roy. Hortic. Soc. **45**: 128-130. 1919. —Report is made of the trial of 61 stocks of carrots together with a classification, brief description and the awards of the Vegetable Committee.—*J. K. Shaw.*

1851. BLIN, H. **L'exploitation rationelle des cressonnières. [The rational utilization of cress-beds.]** Rev. Hortic. **91**: 313-316. *Fig.* 99. July, 1919.—The growing of cress is a profitable industry in the vicinity of large cities. The number of beds which may be formed is directly dependent upon the flow of water available; 70 to 75 litres a minute will supply 240 square meters as a maximum. Each bed should not exceed 80 meters in length and should be so arranged that there is a slow but continuous flow of water through it, the amount of such flow being regulated by an adjustable dam. New plantings are established either by sowing the seeds or transplanting cuttings, which may be put out at any season, though if this is done in August or September a good stand for the more valuable winter harvest will be secured. Successive plantings will furnish a supply throughout the year. Decomposed stable manure is an excellent fertilizer. It should be carefully applied when new beds are established and further application should be made after each cutting. In winter it is advisable completely to submerge the plants to protect them from cold. Such inundation or spraying will aid in the controlling of insect pests. It is possible to harvest a crop from the beds within 3 months following the sowing of the seed, or within one month after transplanting the cuttings. During the rapid growing season the beds may be cut over every 15 to 20 days, and during the winter every six or seven weeks. The shoots should be from 15 to 20 cm. in length before being cut, and care should be used to avoid disturbing the roots. Though the beds would last for many seasons, better results are secured by renewing them each year. The shoots, after being cut, are tied into bunches weighing at least 275 grams each, and these are then packed into oval baskets holding from 15 to 20 dozen bunches. In order to prevent yellowing a space is left in the center of the basket. From an area of 100 square meters about 300 dozen bunches may be harvested, which would yield a gross return of 200 to 280 francs.—*E. J. Kraus.*

1852. FISHLOCK, W. C. **Sweet potatoes.** Report on the Agricultural Department, British Virgin Islands, 1918-19: 3-5. [Imp. Dept. Agric., Barbados. 1919.]—Results of experiments with 31 varieties are recorded, with descriptions of each variety. Bourbon heads the list over a period of 8 years, with a yield of 7600 pounds per acre.—*J. S. Dash.*

1853. LEVY, E. BRUCE. **Swede variety types and their perpetuations by pure seed.** New Zealand Jour. Agric. **19**: 284-287. 1919.—A rough classification of Swede types (of turnips) has been drawn up. Three varieties, as listed by seedsmen, were tested and great variation was found. It is urged that more effort be exercised to select and breed pure strains.—*N. J. Giddings.*

1854. LIVVENTAAL, A. **The crop factory.** Sci. Amer. **122**: 503, 582. *1 fig.* 1920.—An attempt to solve the problem—can gardening be made a standardized industry, independent of the elements? By the novel equipment pictured, heat, moisture, light and other conditions are made constant and labor is reduced to a minimum.—*Chas. H. Otis.*

1855. Meunissier, A. **De quelques idées sur la selection des légumes. [Some ideas on the selection of vegetables.]** Rev. Hortic. 91: 300-303. June, 1919.—This is a discussion of the ideas of variation in general with specific emphasis on the necessity for recognizing pure lines, as defined by Johannsen, as the real basis for selection in crop improvement.—*E. J. Kraus.*

1856. Rogers, Stanley S. **Methods for marketing vegetables in California.** California Agric. Exp. Sta. Circ. 217: 1-19. 1920.—A survey of the probable causes for success or failure in the production and marketing of vegetables in California.—*A. R. C. Haas.*

1857. Stokes, Fred. **The food value of vegetables.** Jour. Roy. Hortic. Soc. 44: 21-30. 1919.—The author has devised a formula for calculating the "economic value" of a crop. This formula applies, however, only when the produce is not sold for profit.—

$$\frac{\text{Caloric value} \times \text{yield in pounds per rod}}{\text{Cost of crop in shillings} \times \text{Number of weeks the ground is occupied}} = \text{Economic value}$$

According to the formula the economic value of potatoes is 69.5, carrots 31.6, kidney beans (dry) 28, peas (shelled) 18, parsnips 15.5, onions 4.3, and cabbage 3.—The various vegetables may not only be valuable because of the amount of proteid, carbohydrate, fat and salts they contain, but also because they yield bulk and furnish the indispensable vitamines. Especially valuable are the green vegetables like spinach, cabbage, celery, etc., which give the body the necessary salts and vitamines and also add the necessary bulk to the diet. The bulbs, especially the onion and leek "are remarkable for their beneficial action upon inflamed mucus membrane and for their germicidal powers." The onion is valuable for its salts and essential oil and no doubt contains "a potent vitamine as well." Roots are of value chiefly because of their salts and carbohydrates and the legumes because of their richness in protein and carbohydrates.—*H. A. Jones.*

1858. Sutton, Arthur W. **How amateurs may secure three successive crops of vegetables in twelve months without the aid of glass houses or of heat.** Jour. Roy. Hortic. Soc. 44: 13-20. 1919.

1859. Woolsey, C. **Sweet potato culture in Arkansas.** Arkansas Agric. Ext. Circ. 90. *20 p., 10 fig.* 1920.—A popular discussion on bedding, cultivating, digging, grading, storing and marketing the sweet potato. Directions are given for seed selection and the common varieties are briefly described.—*John A. Elliott.*

1860. Woolsey, C. **The home vegetable garden in Arkansas.** Arkansas Agric. Ext. Circ. 89. *32 p., 9 fig.* 1920.—A popular presentation of gardening methods suited to the conditions of the state, giving dates of planting, culture and rotation of garden crops.—*John A. Elliott.*

1861. Zimmerley, H. H. **Greenhouse tomato growing in Virginia.** Virginia Truck Experiment Station Bull. 26. *23 p., 2 fig.* 1919.—Methods of growing tomatoes in the greenhouses under Virginia conditions are given. The seed for the winter crop is sown in August and the plants shifted to the beds in September. The seed for the spring crop is sown in November and the plants shifted in December. Discussions of varieties, soil treatment and the control of diseases are given.—*T. C. Johnson.*

HORTICULTURE PRODUCTS

1862. Aguila, Isidoro. **Notas sobre la elaboracion de aceite de oliva. [Notes on the preparation of olive oil.]** La Informacion Agric. [Madrid] 9: 318-322. 1919.—Lists defects occurring in olive oil and gives the causes and approved manner of avoiding them. Proper methods of obtaining high grade oils are discussed.—*John A. Stevenson.*

1863. Anonymous. **A new vegetable ivory.** Sci. Amer. Monthly 1: 346. 1920.—Descriptive of a substance produced from the kernel of an edible fruit growing upon the palm, *Borassus ethiopicum.*—*Chas. H. Otis.*

1864. BANCROFT, WILDER D. [Rev. of: PETERS, CHARLES A. **The preparation of substances important in agriculture.** 3rd ed. *19 x 14 cm. vii + 81 p.* John Wiley and Sons, Inc.: New York, 1919. $.80.] Jour. Phys. Chem. 23: 444. 1919.—See Bot. Abstr. 5, Entry 1100.

1865. BREDEMANN, G., AND CHR. SCHÄTZLEIN. **Über Herstellung und Zusammensetzung kleinasiatischer Traubensaftkonserven.** [Preparation and composition of grape-juice preserves from Asia Minor. Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 16-24. 1919.

1866. CARLES, P. **La prune d'ente et les pruneaux d'Agen: Explication scientifique de leur préparation et des moyens de les conserver temporairement pour l'Europe et de façon indéfinite pour l'exportation mondiale.** [A scientific account of methods used in preparing "prunes of Agen" for foreign and domestic consumption.] Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 219-232. 1918.—The preparation of the fruit consists of two phases, (1) a chemical phase during which it is subjected to temperatures of from 40°-50°C. to facilitate the action of a soluble ferment (oxydase) and (2) a physical phase during which the temperatures are increased to 75°-80°C. to produce desiccation. The author discusses various methods of packing and sterilization.—*I. W. Bailey.*

1867. CREVOST, C., AND C. LEMARIE. **Plantes et produits filamenteux et textiles de l'Indochine.** [Fiber- and textile-producing plants of Indo-China.] Bull. Econ. Indochine 22: 813-837. *Pl. 2.* 1919.—See Bot. Abstr. 5, Entry 1122.

1868. DAVIS, R. A. **Fruit and fruit products in South Africa. III. The canning, drying and preserving business.** South African Jour. Indust. 2: 1138-1148. 1919.

1869. FERNANDEZ, O., F. BUSTAMENTA. **Estudio analitico de los aceites de oliva espanoles.** [Analytical study of the Spanish olive oils.] Rev. R. Acad. Cienc. Exactas, Fisecas y Nat. [Madrid] 17: 281-286. 1919.

1870. HARTMANN, WILHELM. **Über Gärversuche mit Zuckerrüben.** [Fermentation experiments with sugar beets.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 28: 287-290. 1919.

1871. LABORDE, J. **Recherches sur le vieillissement du vin.** [Aging of wine.] Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 37-75. *Tables 1-15.* 1918.

1872. MACH, F., AND M. FISCHER. **Die Zusammensetzung der Moste des Jahres 1918 in Baden.** [Musts of 1918 in Baden.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 93 99. 1919.

1873. MAXWELL, HAROLD L., AND NICHOLAS KNIGHT. **The oil in cherry pits.** Proc. Iowa Acad. Sci. 25: 451-455. 1920.—Oil was extracted from seeds of "the common cherry *Prunus erratus*" [doubtless *P. cerasus*]. It was found to be essentially the same as almond oil, having a saponification equivalent of 276.8.—*H. S. Conard.*

1874. ROETTGEN, THEODORE. **Zur Bestimmung der Milchsäure im Weine.** [Determination of lactic acid in wines.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 99-100. 1919.

1875. ROTHÉA, AND DE BON, F. **Essay industriel de fabrication d'huile d'amandes d'abricots. Resultats analytiques des matières premières et des products obtenus.** [An industrial experiment in regard to the manufacture of oil from apricot seeds. Analytical results of the original material and of the products obtained.] Bull. Sci. Pharm. 26: 505-514. *1 fig.* 1919. —As the title indicates, a description of apricot kernels, of the process of obtaining the oil by expression together with the chemical and physical constants of the oil are given.—*H. Engelhardt.*

1876. STERN, J. **Moste des Jahres 1918 aus den Weinbaugebeiten der Nahe, des Glans, des Rheintales unterhalb des Rheingaues, des Rheingaues, des Rheins, Mains und der Lahn.** [Musts of 1918 of the Rhine Valley, etc.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 91-93. 1919.

1877. TEVIS, MAY. **Cutting the cocoanut cake.** Sci. Amer. Monthly 1: 404-407. *4 fig. and frontispiece.* 1920.—Concerns the cocoanut tree, *Cocos nucifera*, its growth, products and their preparation.—*Chas. H. Otis.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

1878. BANCROFT, WILDER D. [Rev. of: JAEGER, F. M. **Lectures on the principles of symmetry.** *27x18 cm., xii+333 p.* Elzevir Publishing Co.: Amsterdam, 1917.] Jour. Phys. Chem. 23: 516. 1919.—See Bot. Absts. 5, Entry 1451.

1879. BETTS, M. WINIFRED. **Notes on the autoecology of certain plants of the Peridotit Belt, Nelson: Part I. Structure of some plants (No. 2).** Trans. and Proc. New Zealand Inst 51: 136-156. *27 fig.* 1919.

1880. BREWSTER, A. A. **Aerating roots or pneumatophores of mangroves (Avicennia).** Australian Nat. 4: 136. 1920.—These plants have an aerating system strongly suggesting that of the cypress of the southern United States.—*T. G. Frye.*

1881. BREWSTER, A. A. **Germination of choko seed.** Australian Nat. 4: 121. 1920.

1882. BREWSTER, A. A. **Leaf of the grasstree (Xanthorrhoea).** Australian Nat. 4: 135. 1920.—Paper deals with the leaf structure of this xerophyte. The most striking features are the abundance of sclerenchyma, and the occurrence of numerous crystals in the cells of the epidermis.—*T. C. Frye.*

1883. BUCHHOLZ, JOHN T. **Embryo development and polyembryony in relation to the phylogeny of conifers.** Amer. Jour. Bot. 7: 125-145. *89 fig.* 1920.—The author has here summarized all published work on the proembryo and early embryo of conifers, in an endeavor to throw light on the phylogeny of this group by a comparative study of their embryogeny and in particular of the manner in which polyembryony occurs within them. Cleavage polyembryony—the separation of the zygote into a number of smaller units which compete with each other—is distinguished from simple polyembryony, which results from the fertilization of several eggs. The phylogenetic values of these two types of polyembryony and of various other embryological characters are discussed, and the affinities suggested by embryogeny among the 22 genera of conifers studied are represented by a diagram. The occurrence of cleavage polyembryony, together with the presence of an apical cell, of rosette embryos and rosette cells, and the direct organization of embryo initials from the free nuclei of the proembryo are regarded as primitive features. On the other hand, a return to simple polyembryony, the presence of a proembryo that fills the entire egg with cells, an archegonial complex and an embryo cap, together with the organization of embryo initials after walls form in the embryo, are regarded as specialized features characteristic of more recent types.—*E. W. Sinnott.*

1884. BUSCALIONI, L., AND G. MUSCATELLO. **Studio anatomo-biologico sul Gen. Sauraula Willd.** [Anatomical-biological studies on the genus Sauraula.] Malpighia 28: 331-370. *Pl. 5-10.* 1918.—This is the concluding part of a detailed anatomical study, the publication of which was begun in earlier numbers of the journal cited.—*L. W. Riddle.*

1885. CHAMBERLAIN, CHARLES J. **The living cycads and the phylogeny of seed plants.** Amer. Jour. Bot. 7: 146–153. *Pl. 6.* 1920.—The position of the living cycads in the evolution of the seed plants is considered. A general resemblance is noted between the living cycads and the Bennettitales and Cycadofilicales. The last named group is undoubtedly the most primitive. The living cycads are so different from the Bennettitales that there is little likelihood that the former have been derived from the latter. The origin of the living cycads is quite unknown.—Living cycads are also evidently not ancestral to any of the other great groups of seed plants, since they differ so radically from Cordaitales, Ginkgoales, Coniferales, Gnetales and Angiosperms. They are evidently a terminal group on the road to extinction. The author brings forward evidence that it is the Coniferales and the Gnetales, rather than the cycad-like plants, to which we should look for ancestors of the Angiosperms.—*E. W. Sinnott.*

1886. COLLINS, MARJORIE I. **On the leaf-anatomy of Scaevola crassifolia, with special reference to the epidermal secretion.** Proc. Linnean Soc. New South Wales 43: 247–259. *Pl. 17–18, 6 fig.* 1918.—This plant, one of the Goodeniaceae, a xerophyte, with special adaption for sand dune existence (where it will survive burial by elongation and the production of adventitious roots) was found to be characterized by the development of peltate glandular hairs which secrete yellow resin in great quantity. This activity was at a maximum in buds and young leaves and decreased in older leaves, where the resin dried, producing a lacquered appearance on the leaf surface. Mature leaves appeared succulent, the glands shrunken, but active in the region of the leaf base; the resin serving there to protect axillary buds. Other xerophilous adaptations noted were the secondary increase in the size of epidermal cells, massive development of palisade tissue and production of special water storage cells.—*Eloise Gerry.*

1887. FEUCHT, OTTO. **Zur Entstehung des Harfenwuchses der Nadelhölzer.** [**On the formation of "harp-growth" in conifers.**] Naturw. Zeitschr. Forst. u. Landw. 17: 137–139. 1919. —See Bot. Absts. 5, Entry 1326.

1888. FLETCHER, J. J., AND C. T. MUSSON. **On certain shoot-bearing tumors of Eucalypts and Angophoras, and their modifying influence on the growth habit of the plants.** Proc. Linnean Soc. New South Wales 43: 191–233. *Pl. 4–26.* 1918.—The nodules and tumors produced in the axils of the cotyledons and early leaves of Eucalypts and Angophoras are illustrated and discussed with reference to their occurrence, external characteristics and development. These growths are also noted in ten species of other genera. The fully developed tumors, though subject to much variation, are said to be generally characterized by the following stages: (1) Axillary shoot-bearing stem nodules; (2) Composite shoot bearing, stem-encircling tumors; (3) Composite, stem-encircling, shoot-bearing, root-incorporating (but not root-emitting) tumors. Seedlings of the non-Mallee or tree forms of Eucalypts, where tumors usually persist for a limited period only, and do not seriously interfere with growth were especially studied. Six species, apparently exempt from tumors, were found. The Mallee or shrubby forms of Eucalypts (where the tumors incorporate the water-storing roots, persist throughout the life of the plant and appear to cause stunting) and the Angophoras, were also examined. The tumors are considered attributable to parasitic soil organisms, which produce proliferation of the cambium, and not to insects. Related work in Australia and the United States is discussed.—*Eloise Gerry.*

1889. FYSON, P. F. **Note on the oecology of Spinifex squarrosus L.** Jour. Indian Bot. 1: 19–24. *3 fig.* 1919.—This plant and other strand-formation species are not halophytes, but rather xerophytic psammophytes; they depend for their water supply on rain water and dew retained by the sand. Further, the air blown over these plants from the sea is always damp. —*A. J. Eames.*

1890. GRIFFIN, GERTRUDE J. **Bordered pits in Douglas fir: a study of the position of the torus in mountain and lowland specimens in relation to creosote penetration.** Jour. Forestry 17: 813–822. *1 fig.* 1919.—See Bot. Absts. 5, Entry 1334.

1891. HAMILTON, A. A. **Root fasciation in cycads.** Australian Nat. 4: 134. 1920.—All cycadean genera produce root nodules primarily caused by infection with *Bacillus radicicola.*—*T. C. Frye.*

1892. HOLLOWAY, J. E. **Studies in the New Zealand species of the genus Lycopodium: Part III. The plasticity of the species.** Trans. and Proc. New Zealand Inst. 51: 161-261. *Pl. 9-14, 16 fig.* 1919.—Eleven species of *Lycopodium* occur in New Zealand. A comparative study of these, character by character, shows that there is a great range of variability in the plants, but at the same time a distinct interdependence of characters. The author concludes with a discussion of the relationships and phylogeny of the species of *Lycopodium* in the light of his observations.—*L. W. Riddle.*

1893. JIVANNA RAO, P. S. **The formation of leaf-bladders in Eichornia speciosa Kunth (water hyacinth).** Jour. Indian Bot. 1: 219-225. *5 fig.* 1920.—Bladder formation near the base of the petiole is the result of high water content in the plant. All gradations are found from well developed bladders on plants growing in an abundant supply of fresh water, to bladderless leaves on plants growing in pools that are drying up or in mud. An account of the structure of the bladder is given.—*Winfield Dudgeon.*

1894. KASHYAP, S. R. **Abnormal number of needles in the spurs of Pinus longifolia.** Jour. Indian Bot. 1: 115-119. 1919.—The number of leaves on spur shoots of mature trees is quite constantly 3, but an examination of 100 4-year-old nursery seedlings revealed 57 bearing spurs with from 2 to 5 leaves. The number of leaves was 4 in 83.8 per cent of the abnormal shoots, from which the author concludes that "a 3-leaved spur has been derived from a spur with more leaves, and that pines with a small number of needles in their spurs are more specialized than species with a larger number of needles."—*Winfield Dudgeon.*

1895. KENOYER, L. A. **Dimorphic carpellate flower of Acalypha indica L.** Jour. Indian Bot. 1: 3-7. *2 fig.* 1919.—The carpellate flowers on the lower branches of the inflorescence are trilocular; those at the tips of the staminate cymes are unilocular. In the latter there are no traces of other carpels.—*A. J. Eames.*

1896. KIRBY, R. S., AND J. S. MARTIN. **A study of the formation and development of the flower buds of Jonathan and Grimes Golden in relation to different types (clover sod, blue grass sod, cover crop, and clean tillage) of soil management.** Proc. Iowa Acad. Sci. 25: 265-290. *Pl. 7.* 1920.—See Bot. Absts. 5, Entry 1750.

1897. MANARESI, A. **Sulla biologia fiorale del pesco. 2 nota.** [On the floral biology of the peach. 2nd note.] Staz. Sperim. Agrarie Italiane 52: 42-67. 1919.—See Bot. Absts. 5, Entry 1757.

1898. MASCRE, M. **Sur le rôle de l'assise nourriciere du pollen.** [The rôle of the tapetum.] Compt. Rend. Acad. Sci. Paris 168: 1120-1122. *4 fig.* 1919.—An account of the changes taking place in the cytoplasm of the tapetal cells during maturation and spore formation of *Datura arborea L.* At tetrad formation the cytoplasm contains numerous mitochondrial threads and granules, together with tannin corpuscules. The cells are usually multinucleate. In older stages the nuclei disappear, after fusing in pairs; the mitochondria also disappear. As the cytoplasm becomes vacuolate numerous deutoplasmic vesicles appear, as well as some starch.—*F. B. Wann.*

1899. METCALF, WOODBRIDGE. **A precocious youngster.** Amer. Forestry 26: 15. *1 fig.* 1920.—A demonstration of the fact that coniferous cones are simply modified branches, the leaves of which are changed in shape to form the cone scales.—*Chas. H. Otis.*

1900. MILLER, ROBERT B. **The wood of Machaerium Whitfordii.** Bull. Torrey Bot. Club 47: 73-79. *8 fig.* 1920.—See Bot. Absts. 5, Entry 218.

1901. PAMMEL, L. H., AND C. M. KING. **The germination of some trees and shrubs and their juvenile forms.** Proc. Iowa Acad. Sci. 25: 292-340. *Fig. 45-190.* 1920.—See Bot. Abstr. 5, Entry 1380.

1902. POLE-EVANS, I. B., AND K. LANSDELL. **The weeds of South Africa. Notes on the Canada thistle (Cnicus arvensis).** Jour. Dept. Agric. Union South Africa 1: 73-75. *1 fig.* 1920.

1903. RONCAGLIOLO, M. **Descrizione anatomica e comparata degli organi epigei di cinque specie di mimosa.** [Comparative anatomy of the aerial organs of five species of Mimosa.] Malpighia 28: 435-457. 1919.

1904. SABNIS, T. A. **The physiological anatomy of the plants of the Indian desert.** Jour. Indian Bot. 1: 33-43. *16 fig.* 1919.—The author has studied the structure of the leaf and stem of 165 species, 125 genera, and 50 orders of xerophytic plants of the Indian desert. This is the introductory section of his paper and contains chiefly a discussion of the physical aspects of the desert, including tables of meteorological data. The anatomy of a few forms in the Menispermaceae and Capparidaceae is described and illustrated. Herbarium specimens were used, and were sectioned unembedded. [See also Bot. Abstr. 6, Entry 771.]—*A. J. Eames.*

1905. SCHAFFNER, JOHN H. **The dioecious nature of buffalo-grass.** Bull. Torrey Bot. Club. 47: 119-124. 1920.—The buffalo-grass, *Bulbilis dactyloides* (Nutt.) Raf., has been variously considered, and even in our present manuals inconsistent statements are made as to its dioecism. Field observations in Kansas and experimental results indicate that the dioecious condition is the normal one, it being the only one found in the course of this investigation.—*P. A. Munz.*

1906. SHIRLEY, JOHN, AND C. A. LAMBERT. **The stems of climbing plants.** Proc. Linnean Soc. New South Wales 43: 600-609. *Pl. 60-66.* 1918.—The results of the examination of 53 climbing plant stems are given. A grouping of the structures according to natural orders was found impossible, for similar characteristics were common to plants of many different families, especially among dicotyledons. Therefore, classes were created and are discussed in some detail, illustrated, and type species indicated. Under Subclass I: Dicotyledones, are seven classes; (1) *Normales*, single cambium, wood and bast of each bundle lying along the same radius; (2) *Chiastoxylon*, single cambium, in young stems four rays of alternate wood and bast; (3) *Astroxylon*, single cambium, bundles separated by stellate arrangement of pluriseriate rays; (4) *Endophloia*, second bast occurring at inner margin of wood ring (bicollateral); (5) *Exocycla*, besides normal cambium, new cambium;—zones appear successively centrifugally; (6) *Phloiocycla*, new bast zones are produced in centripetal order; (7) *Polycycla*, oldest bundles in pith, then a normal zone of wood and bast, or alternating rings may be formed. Under Subclass II: Monocotyledones, are two classes; (1) *Vulgares*, usual rind and scattered closed bundles; (2) *Abnormales*, differing from subclass (1) in one or other of the above characters. The authors conclude that these abnormal stem structures in climbers assist the free flow of elaborated sap in the bast.—*Eloise Gerry.*

1907. SHREVE, FORREST. **Proliferation in cacti.** [Rev. of: JOHNSON, DUNCAN S. **The fruit of Opuntia fulgida; a study of perennation and proliferation in the fruits of certain Cactaceae.** Carnegie Inst. Wash. Publ. 269. *Pl. 12.* 1918.]—Plant World 2: 182-183. 1919.

1908. STEIL, W. N. **The distribution of the archegonia and the antheridia on the prothallia of some homosporous leptosporangiate ferns.** Trans. Amer. Microsc. Soc. 38: 271-273. *2 fig.* 1919.—In ordinary *Polypodiaceae*, the archegonia are formed on the so-called cushion directly back of the apical notch, and the antheridia on the posterior portion of the prothallium; but in some species the antheridia are produced on the lobes and margins. Under favorable conditions of nutrition male prothallia became monoecious. In Osmundaceae the archegonia are produced on the sides of the midrib from the notch to the posterior end where the anther-

idia are borne. A peculiar arrangement of the sex organs was found on the prothallia of *Pteris ensiformis* Burn. var. *Victoria*. On the prominent and highly developed cushion the archegonia occupy only the highest portions while the antheridia are found on the lower parts from the notch to the posterior end. In some cultures a large number of prothallia produced antheridia only, on both surfaces, especially when the prothallia were equally illuminated on both surfaces. In other cultures when the dishes were about half filled with sphagnum and nutrient solution, several species were grown which produced both archegonia and antheridia on both surfaces. It was observed that prothallia may be grown in weak light indefinitely, but under such conditions antheridia only are produced. When the light is sufficiently strong, archegonia will form with the continued growth of the prothallium, provided fertilisation is prevented.—*S. H. Essary.*

1909. Vielhauer, [—] **Vierblätteriger Klee.** [Four-leaved clover.] Illustrierte Landw. Zeitg. 39: 373-374. 1919.—The formation of four or more leaflets is encouraged by conditions favoring luxuriant growth. It is to be regarded as a condition of robustness or hypertrophy, or as a certain form of fasciation; and it diminishes the fruitfulness of the plant. Whether the property of forming four leaflets is hereditary or not is not known.—*John W. Roberts.*

1910. Vöchting, Hermann. **Untersuchungen zur experimentellen Anatomie und Pathologie des Pflanzenkörpers. II. Die Polarität der Gewächse.** [**Experimental anatomy and pathology of the plant body. II. Polarity.**] *vi*+333 *p., 12 pl., 113 fig.* Tübingen, 1918.—Review by O. von K[irchner] in: Zeitschr. Pflanzenkr. 29: 242-249. 1919 (1920).

1911. von K[irchner], O.. [*Rev. of:* Vöchting, Hermann. **Untersuchungen zur experimentellen Anatomie und Pathologie des Pflanzenkörpers. II. Die Polarität der Gewächse. (Experimental anatomy and pathology of the plant body. II. Polarity.)** *vi*+333 *p., 12 pl., 113 fig.* Tübingen, 1918.] Zeitschr. Pflanzenkr. 29: 242-249. 1919 (1920).—See also next preceding Entry, 1910.

1912. Weatherwax, Paul. **The ancestry of maize—a reply to criticism.** Bull. Torrey Bot. Club. 46: 275-278. 1919.—H. J. Kempton's criticism of author's paper of September, 1918, on the evolution of maize make necessary a brief presentation of the present status of the question. Errors were made in the paper in question in confusing "bracts" with "prophylla" and in substituting "one-rowed" for "single-rowed"; these are to be corrected. The theories of the origin of maize by hybridization and of the ear by fasciation are discussed, and the importance of the use of comparative morphology in explaining the origin of *Zea*, *Euchlaena* and *Tripsacum* from common ancestry is re-emphasized.—*P. A. Munz.*

1913. Wieland, G. R. **Distribution and relationships of the cycadeoids.** Amer. Jour. Bot. 7: 154-171. *Pl. 7, 3 fig.* 1920.—See Bot. Absts. 5, Entry 1999.

1914. Willey, Florence. **The vegetative organs of some perennial grasses.** Proc. Iowa Acad. Sci. 25: 341-367. *Fig. 131-144.* 1920.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

1915. Allen, C. E. **Sex inheritance in Sphaerocarpos.** Proc. Amer. Philos. Soc. 58: 289-316. *27 fig.* 1919.—See Bot. Absts. 4, Entry 486.

1916. Andrews, A. Le Roy. **Dicranoweisia crispula in the White Mountains.** Rhodora 21: 207-208. 1919.—See Bot. Absts. 4, Entry 313.

1917. Andrews, A. LeRoy. **Hymenostomum in North America. I. Delimitation of the genus.** Bryologist 23: 28-31. 1920.—The author maintains that the mosses usually classified

under *Astomum*, *Hymenostomum*, and *Weisia* are so closely related that generic separation is unwarranted; that the revival of *Kleiioweisia* is wholly needless; and that *Tetrapterum* should not be included in *Astomum*. The understanding of the genus has been further obscured by the inclusion of many unrelated tropical and south-temperate forms, as well as by careless identifications. The genus, as here delimited, corresponds with Lindberg's *Mollia*, subgenus *Hymenostomum*; it may be naturally divided into the three subgenera *Astomum*, *Euhymenostomum* and *Weisia*.—*E. B. Chamberlain.*

1918. ARMITAGE, ELEANORA. **On the habitats and frequencies of some Madeira bryophytes.** Jour. Ecol. 6: 220–225. 1918.—See Bot. Absts. 4, Entry 274.

1919. DOUIN, CH. **Le capitule du Marchantia polymorpha expliqu paré Leitgeb et ses disciples. [The receptacle of Marchantia polymorpha explained by Leitgeb and his disciples.]** Rev. Gén. Bot. 32: 57–71. 1920.—A criticism and refutation of the interpretation of Leitgeb who held that growing points in the angles between the original 8 fused thalli (rays) grew into additional archegonium-bearing thalli, which folded underneath and fused with the lower surface of the receptacle.—*L. W. Sharp.*

1920. EVANS, ALEXANDER W. **The North American species of Asterella.** Contrib. U. S. Nation. Herb. 20: 247–312. 1920.—In this revision of the North American species of the liverwort genus *Asterella* Beauv. (including the Mexican and West Indian representatives) 15 species are recognized and very fully described, and the following new species and names occur: *Asterella saccata* (Wahl.) Evans, *A. venosa* (Lehm. & Lind.) Evans, *A. rugosa*, *A. reticulata*, and *A. versicolor*. Five species described by Stephani from Mexico are referred to a list of doubtful species. The systematic treatment is preceded by a discussion of the nomenclature of the genus, which is generally known in Europe under the name *Fimbriaria*, and by notes on its morphological characters.—*S. F. Blake.*

1921. HOLZINGER, JOHN M. **Dr. Correns's investigations and sterile mosses.** Bryologist 23: 27–28. 1920.—Few bryologists, when determining sterile material, seem to use the keys given in the chapter upon Systematic Determinations in Correns's "Vermehrung der Laubmoose durch Brutorgane und Stecklinge." Two examples of the usefulness of these keys are given.—*E. B. Chamberlain.*

1922. INGHAM, W. **Mosses and hepatics of the magnesium limestone of West Yorkshire** (continued). Rev. Bryologique 41: 77–82. 1914. [Issued in 1919.]—See Bot. Absts. 4, Entry 340.

1923. SCHACKE, MARTHA A. **A chromosome difference between the sexes of Sphaerocarpos texanus.** Science 49: 218–219. 1919.—See Bot. Absts. 3, Entry 1034.

1924. WATSON, W. **The bryophytes and lichens of fresh water.** Jour. Ecol. 7: 71–83. 1919.—See Bot. Absts. 4, Entry 310.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

1925. ANONYMOUS. **Index to American mycological literature.** Mycologia 12: 112–114. 1920.

1926. BAL, S. N., AND H. P. CHAUDHURY. **Commentationes Mycologicae. 7. A short study of Plicaria repanda (Wahl.) Rehm on Borassus flabellifer Linn.** Jour. Dept. Sci. Calcutta Univ. 2: 35–36. *1 pl.* 1920.—The authors record the occurrence of the fungus at Calcutta, and give a short description.—*Winfield Dudgeon.*

1927. BAL, S. N. **Commentationes Mycologicae. 5. Vermicularia Jatropha Speg., on Jatropha integerrima.** Jour. Dept. Sci. Calcutta Univ. 2: 31-32. *1 pl.* 1920.—This is a record of the occurrence of the fungus at Calcutta. A short description is given.—*Winfield Dudgeon.*

1928. BEARDSLEE, H. C. **A new species of Amanita.** Jour. Elisha Mitchell Sci. Soc. 34: 198-199. *Pl. 30-31.* 1919.—*Amanita mutabilis* is described, growing on white sand along the coast (Davis Island, North Carolina). In a note by W. C. COKER the same species is also reported in similar soil from Charleston, South Carolina.—*W. C. Coker.*

1929. BÖRGESEN, F., AND RAUNKIAER, C. **Mosses and lichens collected in the former Danish West Indies.** Dansk Bot. Ark. 2⁹: *18 pl.* 1918.—See Bot. Absts. 6, Entry 151.

1930. BOSE, S. R. **Descriptions of fungi in Bengal. (Agaricaceae and Polyporaceae.)** Proc. Indian Assoc. Cultivation Sci. 4: 109-114. *Pl. 1-11.* 1918.—The following species, collected near Calcutta, Hooghly, and neighboring places, are described, and with the exception of the first are figured: *Schizophyllum commune, Lentinus praerigidus, L. caespitosus, L. irregularis, Lepiota ermineus, Collybia mimicus, C. ambustus, Daedalea quercina, Favolus scaber, Polystictus sanguinus,* and *Hexagonia sub-tenuis.* The author states that he expects to publish similar descriptions of the Polyporaceae in Bengal at frequent intervals, and will cover the group in two or three years.—*H. M. Fitzpatrick.*

1931. BOYER, M. G. **Études sur la biologie et la culture des champignons supérieurs. [Biology and culture of mushrooms.]** Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 233-344. *4 pl., 20 fig.* 1918.—The work is divided into two parts: 1. Experiments on the germination of spores and culture of mycelia of edible Basidio- and Ascomycetes. 2. Special researches on *Morchella esculenta* and *Psalliota campestris.*—The author attempted to obtain the germination of many kinds of spores but had only a few positive results. He was thus unsuccessful with *Boletus, Russula* and *Amanita.* Contrary to the findings of MATRUCHOT, DE LESPARRE, and others, the author has never observed the germination of *Tuber* spores. He attempted without success also the germination of spores which had gone through the digestive tract of animals. In contact with oak leaves or rootlets, spores remain equally inert. The author studied in particular a group of fungi neither saprophytic nor apparently parasitic, found in the vicinity of trees. He believes them to be always symbiotic with trees through mycorrhiza. This fact has been satisfactorily proved for several Agaricineae and for *Tuber.* The direct connection between fungus and mycorrhiza is difficult to establish in the species that do not form rhizoids. Symbiotic forms are apparently capable of adopting parasitic habits and vice versa. The author found *Hypholoma fasciculare* and *Trametes pini* growing on earth in contact with their host through mycorrhiza only, and a normally mycorrhizal form (*Boletus*) growing parasitically on tree trunks.—Aseptic Mycelia: CONSTANTIN and MATRUCHOT saved the industry of mushroom culture in France, attacked by *Mycogona perniciosa,* when they introduced in the market aseptic mycelia, raised from spores. The author does not obtain satisfactory results with this method. He recommends another which he believes to be new. It consists simply in growing mycelia not from the spores but from fragments of pseudotissue taken from the pileus or stipe. Most of these cuttings grow vigorously. Those of *Boletus* are of weak growth, and those of *Morchella, Amanita,* and *Tuber,* do not grow at all. This fact the author considers as further proof of the semi-parasitic nature of these latter fungi. The saprophytic mycelia of *Morchella* can easily be obtained from the spores, but it remains permanently sterile. The author believes that in order to produce carpophores *Morchella* must become parasitic or symbiotic. All attempts to bring about this condition have, however, failed. The mycelium remains sterile in field, garden, or orchard. When inoculated on live tubers or rootlets of Jerusalem artichoke, it does not penetrate the living tissue. His special studies on *Psalliota campestris* seemed to prove that cultural characters are preserved by the mycelia arising from cuttings.—*Mathilde Bensaude.*

1932. BRONFENBRENNER, J., AND M. J. SCHLESINGER. **Carbohydrate fermentation by bacteria as influenced by the composition of the medium.** [Abstract.] Absts. Bact. 3: 8. 1919.

1933. CHAUDHURY, H. P. **Commentationes Mycologicae. 6. Phyllosticta glycosmidis Sydow and Butler, on Glycosmis pentaphylla** Corr. Jour. Dept. Sci. Calcutta Univ. 2: 33-34. *1 pl.* 1920.—This is a record of the occurrence of the fungus at Calcutta. A short description is given.—*Winfield Dudgeon.*

1934. CLARK, PAUL F. **Morphological changes during the growth of bacteria.** [Abstract.] Absts. Bact. 3: 2. 1919.—"In some instances as early as two hours after transplanting, and in practically all cases by the fourth or sixth hour of growth, the majority of the organisms in any given smear were approximately twice as large as the organism we have considered the average, namely, the organisms from a twenty-four-hour culture." Members of the diphtheria group are a marked exception. In cultures 4 to 6 hours old the individuals are smaller, less variable and stain more readily than those from cultures 24 hours old. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

1935. COKER, W. C. **The Hydnums of North Carolina.** Jour. Elisha Mitchell Sci. Soc. 34: 163-197. *Pl. 1-29.* 1919.—Twenty-eight species of the larger Hydnums, including *Hydnum, Manina, Steccherinum, Hydnellum, Phellodon* and *Hydnochaete* are reported. Of these, *Hydnellum carolinianum* Coker and *Phellodon Cokeri* Banker are reported as new. Resupinate species are not treated. Of the plates two are in color, three are high power drawings of the spores, the remainder are photographs.—*W. C. Coker.*

1936. COKER, W. C. **Craterellus, Cantharellus, and related genera in North Carolina with a key to the genera of gill fungi.** Jour. Elisha Mitchell Sci. Soc. 35: 24-48. *Pl. 1-17 (in color).* 1919.—Twenty-six species are reported, belonging to the following genera: *Bomycenella, Trogia, Nyctalis, Craterellus, Cantharellus* and *Plicaturella.* Plate 17 gives the spore characters.—*W. C. Coker.*

1937. DARNELL-SMITH, G. P. **The occurrence of an inverted hymenium in Agaricus campestris.** Proc. Linnean Soc. New South Wales 43: 883-887. *Pl. 91-93.* 1918.—The article records teratological observations on *Agaricus campestris* derived from a particular sample of spawn imported from France. The under surface was normal but the upper surface was broken by one or more black protuberances composed of irregular, sinuous, labyrinthiform lamellae having the appearance of small inverted caps without stipe. These were quite separate from the normal hymenium. Spores were borne upon enlarged cells provided with 1-4 sterigmata. These abnormal mushrooms are considered as a partial reversion to an ancestral, cylindric, dome-shaped form having semi-alveolar or labyrinthiform gill formation over the exposed upper surface. In the evolution of the normal cap the hymenium is considered as having been relegated to the lower surface, the gills having developed from the original pore or alveolar structure.—*C. J. Humphrey.*

1938. DE MELLO, FROILANO. **Contribution to the study of the Indian Aspergilli.** Jour. Indian Bot. 1: 158-161. 1920.—The author describes *Aspergillus (Sterigmatocystis) polychromus* as a new species, and records its behavior on a number of different culture media.—*Winfield Dudgeon.*

1939. DONK, P. J. **Some organisms causing spoilage in canned foods, with special reference to flat sours.** [Abstract.] Absts. Bact. 3: 4. 1919.—See Bot. Absts. 5, Entry 2164.

1940. EBERSON, FREDERICK. **A yeast-agar medium for the meningococcus.** [Abstract.] Absts. Bact. 3: 10. 1919.—"The primary objects of these experiments have been attained, namely to find a cheap and simple medium which would enable us to maintain cultures of a delicate organism such as the meningococcus so that shipment over long distances might be practiced without danger of losing valuable strains."—Preparation of medium: Macerate 10

grams of bakers' or brewers' yeast in 100 cc. of water for 20 minutes; steam for 2 hours at 100°; filter twice through filter paper, or perhaps preferably, clarify by use of glass wool; prepare a 2.5 per cent agar with or without peptone and salt; to each 60 cc. of agar, add 40 cc. of yeast decoction; sterilize in autoclave for 20 to 30 minutes. A semisolid yeast agar (0.5 per cent) "will prolong the viability for beyond the periods observed for the solid medium."—[From abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

1941. FERDINANDSEN, C., AND Ö. WINGE. **A Phyllachora parasitic on Sargassum. Mycologia 12: 102-103. *2 fig.* 1920.**—*Phyllachora oceanica* is described as a new species. It produces swellings on *Sargassum.*—*H. R. Rosen.*

1942. GILBERT, E. M. **A peculiar entomophthorous fungus.** Trans. Amer. Microsc. Soc. 38: 263-269. *Pl. 27, 28, fig. 1-23.* 1919.—Among the fungi found on fern prothallia grown in water cultures or on moist sphagnum, one appeared from time to time which seemed to be a vigorous parasite. It was isolated and pure cultures were obtained on THAXTER'S potato hard-agar plus LOEFLUND'S malt extract. An effort was made to find an insect upon which it would grow; but no infections were secured upon any of the insects of the greenhouse, nor upon vigorous fern prothallia, although it would grow on dying fern prothallia. The fungus seems to be of a decided saprophytic nature. Other investigators have observed a saprophytic condition in certain members of the Entomophthorales. The fungus grows rapidly. No haustoria or rhizoidal growths are found. The hyphae branch and become septate; the cells compare favorably with those of *Empusa*, but differ in many particulars. The shape and size of cells vary greatly. Conidiophores arise usually from terminal cells. No sclerotia are found. Conidiophores, usually simple, are sometimes compound, each branch producing a single conidium. By a process not fully understood, the basidium ruptures and projects the ripened conidium often to a distance of 65 mm. Upon a substratum containing moisture the conidia germinate in from 6 to 12 hours and put forth from one to four germ tubes which develop a typical mycelium. Upon a dry surface the conidia germinate and produce secondary conidia which are discharged like the primary ones, and these may germinate and produce tertiary spores. Primary conidia have diameters of 48 to 60 μ, secondary, 35 to 40 μ, and the tertiary 20 μ. Some conidia do not germinate upon an unfavorable substance; but form a thick wall and appear to be resting spores, although germination has not been observed.—*S. H. Essary.*

1943. GILKEY, HELEN M. **Two new truffles.** Mycologia 12: 99-101. *Fig. 1.* 1920.—*Tuber canaliculatum* and *T. unicolor* are described as new species.—*H. R. Rosen.*

1944. HAMMER, B. W. **Bacteriological results obtained in practice with vat pasteurization and with one of the final package methods.** Iowa Agric. Exp. Sta. Bull. 190: 151-158. 1919.

1945. HAMMER, B. W. **Studies on formation of gas in sweetened condensed milk.** Iowa Agric. Exp. Sta. Res. Bull. 54: 211-220. *2 fig.* 1919.—See Bot. Absts. 5, Entry 2199.

1946. HAMMER, B. W., AND D. E. BAILEY. **The volatile acid production of starters and of organisms isolated from them.** Iowa Agric. Exp. Sta. Res. Bull. 55: 223-246. 1919.—See Bot. Absts. 5, Entry 2172.

1947. HEMMI, TAKEWO. **Vorläufige Mitteilung ueber eine Anthracnose von Carthamus tinctorius. [Preliminary report of an anthracnose of Carthamus tinctorius.]** Ann. Phytopath. Soc. Japan 1[2]. *11 p., fig. 1-2.* 1919.—See Bot. Absts. 3, Entry 2659.

1948. HERRE, ALBERT C. **Notes on Mexican lichens.** Bryologist 23: 3-4. 1920.

1949. HERRE, ALBERT C. **Hints for lichen studies.** Bryologist 23: 26-27. 1920.—Much valuable work could be done upon the physiology of the growth and luxuriance of lichens, especially in the case of rock- or bark-inhabiting species, without taxonomic knowledge. There are great possibilities in the study of the inheritance of lichen species.—*E. B. Chamberlain.*

1950. KEENE, M. LUCILLE. **Studies of zygospore formation in Phycomyces nitens Kunze. Trans. Wisconsin Acad. Sci. 19: 1196-1219. *Pl. 16-18, 17 fig.* 1919.**—Cytological studies of the plus and minus strains of *Phycomyces nitens* were made but no constant morphological or cytological differences could be determined at any phase of the life cycle. The internal and external changes occurring before and after conjugation are described and illustrated. Following a characteristic grouping of the nuclei, there appears to take place a fusion of nuclei in pairs. The disorganization of part of the nuclei, probably the unfused ones, is followed by the appearance of reserve substances: a large amount of oil and a nucleo-protein-like substance.—*L. K. Bartholomew.*

1951. KLEBAHN, H. **Haupt- und Nebenfruchtformen der Askomyzeten. Erster Teil: Eigene Untersuchungen.** [Perfect and imperfect stages of ascomycetes.] *395 p., 275 fig.* Gebr. Borntträger: Leipzig, 1918.

1952. LATHAM, ROY. **Musci hosts of Cyphella muscigena Fr.** Bryologist 23: 7. 1920.—The author notes that in Southold, New York, the fungus seems to prefer *Thuidium paludosum* as host to the exclusion of other, intimately associated species.—*E. B. Chamberlain.*

1953. LEIDY, JOSEPH. **Modification of Gram's stain for bacteria.** [Abstract.] Abstr. Bact. 3: 7. 1919.—"In the course of some experiments in staining bacteria according to Gram's method it was found that any of the metallic iodides soluble in water may be substituted for the potassium iodide in Gram's (Lugol's) solution." [From author's abstract of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

1954. L'ESTRANGE, W. W., AND R. GREIG-SMITH. **The "springing" of tins of preserved fruit.** Proc. Linnean Soc. New South Wales 43: 409-414. 1918.—Cans of pears and plums, as compared with apricots and peaches, were found to be especially susceptible to "springing." Yeasts chiefly, certain moulds and bacteria sometimes, apparently in an inactive condition, were found. Suggestions for better operating methods are given.—*Eloise Gerry.*

1955. LLOYD, C. G. **Mycological notes. No. 57.** *P. 839-844, fig. 1388-1412.* Cincinnati, Ohio, April, 1919.—A photograph of J. RAMSBOTTOM is accompanied by a brief personal appreciation. The status of the genus *Laschia* is discussed, and about twenty species are cited with annotations. Under the heading "rare or interesting fungi received from correspondents" the following are discussed and in most cases figured: *Clathrus cancellatus, Lentinus rivulosus, Hydnum pulcherrimum, Dacryomitra depallens, Polystictus pinsitus, Dacryopsis nuda, Polystictus felipponei, Polyporus grecnii, Polystictus scopulosus, Podocrea zylarioides.*—*H. M. Fitzpatrick.*

1956. LLOYD, C. G. **Mycological notes. No. 58.** *P. 814-828, fig. 1358-1387.* Cincinnati, Ohio, March, 1919.—A short account of ARTHUR LISTER's life and work is accompanied by a photograph of this well known student of the myxomycetes. The following "rare or interesting fungi received from correspondents" are discussed and in most cases figured: *Campanella cucullata, Durogaster brunnea, Rimbachia pezizoidea, Geaster tomentosus, Tremella mellea, Polyporus smaragdinus, Porodiscus rickii, Polystictus hexagonoides, Favolus caespitosus, Pterula fruticum, Daldinia albozonata, Polyporus setiger, Polyporus atrohispidus, Lentinus chordalis, Guepinia elegans, Dacryomyces pallidus, Tremella compacta, Dacryomitra dubia, Stereum corruge, Polyporus pertusus, Lachnocladium braziliense, Dacryomyces hyalinus.*—*H. M. Fitzpatrick.*

1957. LLOYD, C. G. **Mycological notes. No. 59.** *P. 846-860, fig. 1415-1443.* Cincinnati, Ohio, June, 1919.—A good likeness of GEORGE F. ATKINSON appears on the cover of the pamphlet. A short personal appreciation accompanies it. The genus *Trichoscypha* is discussed and three species are described. These are *T. insititia, T. hindsii,* and *T. Tricholoma.* The following fungi are discussed and in many cases figured: *Trametes heteromorpha, Trametes sepium, Trametes serpens, Tremella candida, Irpex caespitosus, Lenzites betulina, Cata-*

stoma levispora, Trametes truncatospora, Isaria mokanshawii, Polyporus rugosissimus, Isaria ritchiei, Polystictus crocatiformis, Trametes epitephra, Cyphella fuscodisca, Cordyceps lloydii, Polyporus murrillii, Heterochaete gelatinosa, Pseudohydnum guepinoides, Fomes gibbosus, Polyporus suaderis, Lenzites stryacina.—H. M. Fitzpatrick.

1958. LLOYD, C. G. **Mycological notes. No. 60.** *P. 862-876, fig. 1483-1496.* Cincinnati, Ohio, August, 1919.—The cover of this pamphlet bears a good likeness of CHARLES E. FAIRMAN. A brief statement calls attention to Doctor Fairman's mycological activities. A short review of KAUFFMAN'S "Agaricaceae of Michigan" is given. The genus Pterula is discussed and notes and figures are given for twenty-four species. A short note on the genus *Dendrocladium* is appended. Under the heading "tremellaceous plants," notes are given on the following species: *Tremella vesicaria, T. hispanica, T. glaira, T. samoensis, T. sarcoides, Auricularia ornata, A. mesenterica, Exidia janus, Dacryopsis brasiliensis.—H. M. Fitzpatrick.*

1959. LLOYD, C. G. **Mycological notes. No. 61.** *P. 877-903, pl. 124-159.* Cincinnati, Ohio, 1919.—Attention is called to the fact that phalloids and other fleshy forms, when packed in cotton saturated with formalin, can be shipped long distances in good condition. Notes are given on many species of fungi received from correspondents, especially those sent from various countries of the southern hemisphere. These include species of many genera of the higher fungi. New species are described in *Polyporus, Polystictus, Plychogaster, Hexagona, Stereum, Mitrula, Isaria, Septobasidium, Calocera, Rhizopogon, Catostoma, Lachnocladium, Xerotus, Exidia, Daldinia, Xylaria,* and *Auricularia.* Critical notes are given on many species of *Xylaria.* A discussion is given of the probable identity of *Ceracea* and *Arrhytidia,* and their separation from *Dacryomyces* is questioned. A new genus of the Lycoperdales, *Bovistoidea,* is founded on the species, *B. simplex* n. sp. from South Africa. The genus is characterized by the presence of simple capillitial threads with pointed ends. Attention is directed to several misdeterminations in BAKER'S "Fungi Malayana." In a discussion of the genus *Septobasidium* it is pointed out that three pileate species are known, and a genus *Rudetum* McGinty is facetiously proposed for these. In the same vein *Pseudothelephora gelatinosa* McGinty is proposed for a gelatinous *Thelephora* received from India. A report of the collection of a species of *Cauloglossum* in the Philippines, *C. saccatum,* is shown to be incorrect, the genus being regarded as still monotypic. Photographs are given for the fungi discussed. Due to the high cost of printing, this number of Mycological Notes is distributed in mimeographed form, and the announcement is made that this policy will be continued.—*H. M. Fitzpatrick.*

1960. MACINNES, L. T., AND H. H. RANDELL. **Dairy produce factory premises and manufacturing processes: the application of scientific methods to their examination.** Agric. Gaz. New South Wales **31**: 255-264. *9 fig.* 1920.—See Bot. Absts. 5, Entry 2254.

1961. MERRILL, E. D., AND H. W. WADE. **The validity of the name Discomyces for the genus of fungi variously called Actinomyces, Streptothrix and Nocardia.** Philippine Jour. Sci. **14**: 55-69. 1919.—This is an effort to determine the accurate designation for a group of fungi whose pathogenic members produce various actinomycoses. By the accepted principles of botanical nomenclature, *Streptothrix* Cohn (1875) is invalidated by *Streptothrix* Corda (1839), and *Actinomyces* Harz (1871) by *Actinomyce* Meyen (1827). *Discomyces* Rivolta (1878) would accordingly be valid, *Actinocladothrix* Affanassiew and Schultz (1889) and *Nocardia* Trevisan (1889) are to be regarded as synonyms of *Discomyces. Discomyces* as a generic name is not invalidated by *Discomycetes* as a group name.—Bibliography.—*Albert R. Sweetser.*

1962. MOESZ, G. **Mykologiai Közlemények. III. Közlemény. [Mycological investigations. III.]** Bot. Közl. **17**: 60-78. *11 fig.* 1918. [Summary in German.]—Taxonomic and life history studies of the following. (1) *Herpotrichia nigra* and *Neopeckia coulteri* found on *Pinus pumilio, Juniperus* and *Picea excelsa; Ozonium plica* is connected with latter. Location of these species in herbaria is indicated. (2) *Lizonia emperigonia* (Auersw.) de Not. f. *Baldinii* (Pir.) Moesz on *Polytrichum commune.* (3) *Pachybasidiella microstromoidea* (prior

to 1909 as *Gloeosporium*) a saprophyte on capsules of *Catalpa bignonioides*. (4) *P. polyspora* Bub. et Syd. parasitic on leaves of *Acer dasycarpum*. (5) *Leptosphaeria crepini* (Westd.) de Not. on sporophylls of *Lycopodium annotinum* turning them black. (6) *Pyrenochaeta clithridis* n. sp. described from an old fruit body of *Clithris quercina*, *Phoma salsolae* n. sp. from *Salsola kali* and *Aecidium* sp.? from *Rhamnus fallax*. (7) New species of saprophytic fungi described and the host range for old ones extended. [Through abst. by MATOUSCHEK in Zeitschr. Pflanzenkr. 29: 252–253. 1919 (1920).]—*D. Reddick*.

1963. MURRILL, W. A. **A correction.** Mycologia 12: 108–109. 1920.—An error in citation is noted in 25 species of polypores which are found to have been transferred to the genus *Poria* by COOKE two years in advance of SACCARDO's transfers.—*H. R. Rosen*.

1964. MURRILL, W. A. **Daedalea extensa rediscovered.** Mycologia 12: 110–111. 1920.—Specimens collected in Indiana are referred to *D. extensa*; PECK's original description of this species is given.—*H. R. Rosen*.

1965. MURRILL, W. A. **Polyporus excurrens Berk. & Curt.** Mycologia 12: 107–108. 1920.—This species is considered as synonymous with *Trametes rigida* Berk. & Mont., *Polystictus extensus* Cooke, *P. rigens* Sacc. & Cub., *Coriolopsis rigida* (Berk. & Mont.) Murr. Since American specimens referred to *Trametes serpens* are considered distinct from the European material *T. subserpens* is suggested as a new name for American material.—*H. R. Rosen*.

1966. MURRILL, W. A. **Light-colored resupinate polypores—I.** Mycologia 12: 77–92. 1920.—Twenty-seven species of *Poria* are presented including *P. incerta* (Pers.) comb. nov. and the following new species. *P. umbrinescens*, *P. lacticolor*, *P. nivicolor*, *P. cremeicolor*, *P. adpressa*, *P. tenuipora*, *P. Earlei*, *P. corioliformis*, *P. regularis*, *P. polyporicola*, *P. cinereicolor*, *P. subavellanea*, *P. subcorticola*, *P. Amesii*, *P. subcollapsa*, *P. monticola*, *P. lacerata*, *P. rimosa*, and *P. heteromorpha*. "The descriptions included are mainly from dried specimens. Before the hundreds of such specimens in the herbarium here can be intelligently discussed, referred to, or classified, they must be named and more complete descriptions can be prepared later."—*H. R. Rosen*.

1967. MURRILL, W. A. **Illustrations of fungi—XXXII.** Mycologia 12: 59–61. *Pl. 8 (colored)*. 1920.—*Boletus luteus*, *Tylopilus alboater* (*Boletus nigrellus*), and *Armillaria nardosmia* are described and illustrated.—*H. R. Rosen*.

1968. NORTHRUP, ZAE. **A new method of preparing cellulose for cellulose agar.** [Abstract.] Absts. Bact. 3: 7. 1919.—"The method is as follows: Melt over a free flame at a low heat 200 grams of ferric chlorid in a porcelain casserole. Add to this completely melted salt a known weight of absorbent cotton, a little at a time (stir with a glass rod), as much as the melted salt will dissolve without making the mixture too thick to be handled readily. When completely dissolved, pour into a large volume of distilled water; a heavy precipitate of finely divided hydrocellulose occurs. Filter by using a Buchner or similar funnel plus suction and wash the precipitate thoroughly on the filter with distilled water. After the thorough washing with distilled water, if any trace of iron chlorid remains, it may be considered as negligible as it is harmless, and may be actually beneficial to the medium. Weigh the moist precipitate to determine the proportion necessary to use per unit weight of original cellulose in making cellulose agar. The weight of hydrocellulose corresponding to 2 grams of absorbent cotton has been found sufficient in Omeliansky's and other cellulose agar media. Pure absorbent cotton dissolves much more satisfactorily than filter paper and gives a more finely divided precipitate, consequently this is the form now employed as a standard in our laboratory." [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick*.

1969. NORTHRUP, ZAE. **Agar-liquefying bacteria.** [Abstract.] Absts. Bact. 3: 7. 1919.—Found in anaerobic culture from soil. Pure cultures are to be isolated and studied.—*D. Reddick*.

1970. Pammel, L. H. **Perennial mycelium of parasitic fungi.** Proc. Iowa Acad. Sci. 25: 259-263. 1920.—See Bot. Absts. 5, Entry 2082.

1971. Petronel, B. **Sul nerume o marciume nero delle castagne. [On the blackening or black rot of chestnuts.]** Staz. Sperim. Agrarie Italiane 52: 21-41. *Pl. 1-4.* 1919.—See Bot. Absts. 5, Entry 2083.

1972. Reinking, Otto A. **Phytophthora Faberi Maubl.: The cause of coconut bud rot in the Philippines.** Philippine Jour. Sci. 14: 131-151. *5 pl.* 1919.—See Bot. Absts. 5, Entry 2087.

1973. Rettger, Leo F., and C. C. Chen. **Correlation within the Colon-Aerogenes group.** [Abstract.] Absts. Bact. 3: 1. 1919.—467 cultures isolated from soil, 20 of which were of colon type, and 173 from animals all of which were colon type. Media used were (1) Clark and Lubs medium with Witte's peptone, (2) the same with "Difco" peptone, (3) their synthetic medium. "A total of 3725 individual hydrogen ion concentration determinations and 4632 Voges-Proskauer reactions were made. The P_H was determined by the colorimetric method of Clark and Lubs; the dyes used being brom-thymol blue for the aerogenes group and methyl red for the colon type. Brom-cresol purple was used to check the P_H values of the other two dyes, especially in the range 5.6 to 6.4. The result showed that a three days incubation period was not sufficient for the methyl red test in these media; but an almost perfect correlation between the two types was observed in the synthetic as well as in the Witte's peptone medium (not in the Difco) when the incubation period was prolonged to 5 days.—The results of the Voges-Proskauer tests showed that this test can be made in either of the three media, and that the usual incubation period can be shortened from 5 days to 24 hours (even to ten to fourteen hours). A positive reaction may be obtained by the simple and rapid "shake" method in which the eosin-coloration can be observed for 1 to 3 hours, and its maximum color production from 2 to 8 hours. The method of Levine in which an oxidizing agent is used, and that of Bunker, Tucker and Green in which they expose a thin layer of culture fluid in a Syracuse watch glass both proved either uncertain or too laborious.—With the few exceptions which occurred among the colon strains from soil, the uric acid test of Koser gave very satisfactory correlation with the other reactions when the necessary precautions were taken.—The effect of a mixture of colon-aerogenes types of organisms upon the P_H and upon the Voges-Proskauer test was determined. It was found that the P_H concentration was disturbed between types when such a mixed culture was used, while the Voges-Proskauer reaction proved to be relatively permanent.—The limiting P_H concentration of the colon-aerogenes types of organisms was determined daily in the synthetic medium of Clark and Lubs for a period of 3 weeks. The result showed that the P_H concentration ranged from 4.7 to 7.4 within that period." [From authors' abst. of paper read at scientific section, Soc. Amer. Bact.]—*D. Reddick.*

1974. Rettger, Leo F., and Margaret M. Scoville. **Bacterium anatis, Nov. Spec., an organism of economic importance and a member of the paratyphoid group.** [Abstract.] Absts. Bact. 3: 8. 1919.—An organism resembling very closely *B. paratyphosus B.* was isolated from the internal organs of ducklings which had succumbed. "Indeed so similar were the morphology, cultural characters, etc., of the new organism and different strains of *B. paratyphosus B.* that it has as yet been impossible to differentiate them, although agglutination tests still remain to be made." [From abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

1975. Rippel, August. **Die chemische Zusammensetzung von Lactaria piperita (Scop.) und Lacteria vellerea (Fries). [The chemical composition of Lactaria piperita (Scop.) and Lactaria vellerea (Fries.).]** Naturw. Zeitschr. f. Forst- u. Landw. 17: 142-146. 1919.—A chemical analysis of the two varieties, which are difficult of distinction to the beginner, is given in two tables. A comparison shows a similar content of phosphoric acid and potassium. Crude fats are slightly more abundant in *vellerea*, and greater in both than in other fungi.

Vellerea also has a higher percentage of crude fiber. The soluble portion of the fiber is not cellulose, but, more than likely, hemicellulose. The chief difference consists in the greater resistance of the cell walls of *vellerea*, which makes it more difficult for digestive juices to attack the nitrogenous constituents and albumen bodies (which are more abundant in *vellerea* than in *piperita*) in this variety. It has not been definitely determined what causes this difficult permeability; it may be chitin. In general, the differences may be traced back with some degree of probability to the tomentose elements of the cap and to the large number of fertile elements resulting from dense-growing lamellae.—*J. Roeser.*

1976. SCHØYEN, T. H. **Betydningsfulde nyere undersøkelser over furuens blærerust.** [**Important new investigations on Peridermium pini.**] Tidsskr. Skogbruk 28: 28-29. 1920.

1977. SEAVER, F. J. **Notes on North American Hypocreales—IV. Aschersonia and Hypocrella.** Mycologia 12: 93-98. *Pl. 6.* 1920.—*Aschersonia* is considered as the imperfect stage of *Hypocrella*. On this basis a new combination, *Hypocrella turbinata* (Berk.), is made. *H. disjuncta* sp. nov. said to occur on white fly is briefly described and the belief expressed that species of *Hypocrella* may prove to be of economic importance in combating harmful insects. —*H. R. Rosen.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. BERRY, *Editor*

1978. BACCARINI, P. **Intorno all'ologenesi.** [Concerning ologenesis.] Nuovo Gior. Bot. Ital. 26: 115-128. 1919.—DANIELE ROSA in his recent book "New theory of evolution and the geographic distribution of life," makes an attempt to give on the basis of ologenesis a better explanation of evolution and the distribution of plants and animals than could be had from the theories of DARWIN, LAMARCK and DE VRIES. In brief, these are the writer's contentions: (1) The evolution of the specific idioplasm, which is bound up with the phylogeny of the organisms, is predetermined, continuous and independent of external factors. (2) The evolution of the idioplasm is rectilinear up to a certain point when due to increasing complexity the idioplasm divides dichotomously which results in the complete elimination of the mother form and the establishment of two new "species" which in turn develop and then divide. (3) The evolution is not reversible because the products of a dichotomous division have a different constitution since, as was stated above, a certain part of the characters of the mother form have become completely eliminated $A = \frac{B}{C}$. (4) Each new "phyletic species" (the complex of individuals lying between two dichotomous divisions) stands at the end of the genealogical tree and consequently its phylogenetic prospects are much reduced. Furthermore, there is a tendency, as evolution proceeds, for the new forms to become stabilized so that new dichotomous divisions occur only at great intervals. Phyletic and systematic species are not identical. The former has but a limited duration, although throughout its existence it may pass through a number of different stages which would be considered distinct species, or even genera, by the systematist. (5) The large branches of the evolutionary tree are to be sought in the early geological ages when the phylogenetic prospect of the idioplasm was at its prime. The creation of new forms, due to the dichotomous divisions of the idioplasm, does not always find immediate expression because of external conditions. A "mollusk," for example, may have been potentially a mollusk long before climatic and environmental conditions permitted of the existence of mollusks. This indicates why there is such a lack of connections in the evolutionary line, and why there is such an apparent polymorphism. (6) Since the division of the idioplasm of a given form took place simultaneously in all individuals and throughout the entire area occupied by them, it becomes an easy matter to account for the geographic distribution of species and to explain geographic anomalies without having to resort to the migration hypothesis. (7) In the development of the two species of a dichotomous division one form may advance more rapidly and soon reach the apex of its development, while the other,

proceeding slower, gives rise to a greater variety of forms.—When contrasted with the theory of Darwin or de Vries, ologenesis offers a better explanation for the origin of the large evolutionary lines, for the richness of the flora and fauna as far back as the Cretaceous and also for the geographic distribution of species. The chances for the new forms to arise and exist are greater because new forms do not arise as single mutations but simultaneously throughout the entire area occupied by a species which is undergoing division. Of course the explanation of the theory of ologenesis is a teleological one, but it is a teleology which rests on a firm physical and mechanical basis. The author realizes that the hypothetical element in the theory is still large and that it will be necessary to accumulate more evidence before it is accepted altogether.—*E. Artschwager.*

1979. Bancroft, Wilder D. [Rev. of: Jaeger, F. M. **Lectures on the principles of symmetry.** *xii + 333 p.* Elsevier Publishing Co.: Amsterdam, 1917.] Jour. Phys. Chem. 23: 516. 1919.—See Bot. Absts. 5, Entry 1451.

1980. Baker, Frank C. **The life of the Pleistocene or glacial period.** Univ. Illinois Bull. 17. *vi + 476 p. 57 pl.* 1920.—Essentially geological and zoological, but useful to the botanist in that it contains lists of species of plants and bibliography covering the glaciated and nearby areas of North America.—*E. W. Berry.*

1981. Berry, E. W. [Rev. of: Seward, A. C. **Fossil plants.** Vol. 4. Cambridge Univ. Press: Cambridge, England, 1919.] Plant World 22: 341–342. (Nov., 1919) March, 1920.

1982. Brown-Blanquet, Josias. **Sur la decouverte du Laurus canariensis Webb et Berth., dans les tufs de Montpellier.** [Discovery of Laurus canariensis in the tuffs of Montpellier.] Compt. Rend. Acad. Sci. Paris 168: 951–952. 1919.—Description of fragments of leaves determined as *Laurus canariensis* Webb and Berth. The presence of this species in these deposits confirms the oceanic and relatively alpine character of the flora at the time of their formation.—*F. B. Wann.*

1983. Buchholz, John T. **Embryo development and polyembryony in relation to the phylogeny of conifers.** Amer. Jour. Bot. 7: 125–145. *89 fig.* 1920.—See Bot. Absts. 5, Entry 1883.

1984. Caullery, Maurice. **Parasitism and symbiosis in relation to evolution.** Sci. Amer. Monthly 1: 399–403. *4 fig.* 1920. [Presidential address delivered before the British Association for the Advancement of Science (the Australian meeting, 1914).]—A criticism of Professor Portier's theory of universal symbiosis.—*Chas. H. Otis.*

1985. Chamberlain, Charles J. **The living cycads and the phylogeny of seed plants.** Amer. Jour. Bot. 7: 146–153. *Pl. 6.* 1920.—See Bot. Absts. 5, Entry 1885.

1986. Conklin, E. J. **The mechanism of evolution.** Sci. Monthly 10: 392–403. 1920.—As the chromosomes contain the genes or factors of Mendelian inheritance, many investigators have assumed that the cytoplasm serves only as environment or food for the chromosomes and has nothing to do with heredity. It is true that the spermatozoon is highly differentiated. But the tail of the spermatozoon is either left outside of the egg or its differentiation disappears within the egg. And the yolk of the egg is used up as food.—But there is positive evidence that all cytoplasmic differentiations are not wiped out at this time. Certain cytoplasmic differentiations found in the egg persist in the embryo and adult. Polarity, symmetry, asymmetry, and types of egg organization are of this character.—This egg cytoplasm inheritance is non-Mendelian. Consequently the egg contributes more than the spermatozoon to each generation. This may be somewhat complicated by the fact that the egg has its characters determined by the chromosomes of the cells from which it developed. This would be Mendelian inheritance with its beginnings in the preceding generation. If they are not determined in this way, but are carried from generation to generation in the cytoplasm the inheritance is non-Mendelian. [See also next following Entry, 1987.]—*L. Pace.*

1987. CONKLIN, E. G. **The mechanism of evolution.** Sci. Monthly 10: 496–515. 1920.—**At present there is not sufficient evidence to conclude that modifications of the cytoplasm of the germ cells are ever really inherited or that they are the initial stages in evolution.—Almost all the experimentally produced changes in chromosomes which are known to persist occur during mitoses.—Variations in the volume of chromosomes are dependent upon the volume of the resting nucleus and cytoplasm. These variations have no hereditary or evolutionary value, as is evident from a comparison of the nuclei and chromosomes of the spermatozoa and ova which differ in volume but not in value.—Abnormalities in synapsis, separation and equatorial division of chromosomes are much more important. The two former occur only in the formation of germcells, the latter may occur in any cell.—Changes in the number of chromosomes are known in *Oenothera*, *Ascaris*, and *Drosophila*.—Changes in the constitution of chromosomes by "crossing-over" of sections of homologous chromosomes or by fragmentations or fusions so that a chromosome is not invariably composed of the same chromomeres has been reported.—Experimental modification of chromosomes has produced monstrosities which have not been carried to the next generation. But heat has been shown to increase the number of "cross-overs" in the oocyte of *Drosophila*. These are transmitted. Probably other changes in the constitution of chromosomes may be traced to environmental influences. If so initial stages in evolution may find their causes in such influences.—Genes seem to be subject to all the possibilities just discussed for chromosomes.—In conclusion, it is held that the initial stages in evolution are caused by new combinations of chromosomes, chromomeres, genes, subgenes, and that these new combinations take place in response to stimuli from the external or internal environment.—Germ cells are so complex and so delicately adjusted that they can not usually be greatly changed without rendering them incapable of continued life. The future may show us methods of modifying germ plasm more delicate than those now known. This would make a real experimental evolution possible.—The mystery of mysteries in evolution is how germ plasm ever became so complex. The greatest problem which confronts us is no longer the mechanism of evolution, but the evolution of this mechanism.** [See also next preceding Entry, 1986.]—*L. Pace.*

1988. G., A. [Rev. of: CHURCH, A. H. **Thallassiophyta and the subaerial transmigration.** Botanical Memoirs, No. 3. Oxford University Press, 95 p. 1919.] Jour. Botany 58: 59–61. 1920.

1989. GOTHAN, W., AND NAGEL, K. **Eine Zechsteinflora (Kupferschieferflora) aus dem untern Zechstein des Niederrheins. [A flora from the copper shales of the lower Zechstein in the lower Rhine region.]** Glückauf 56[2]: 105–107. *1 pl.* Feb., 1920.—Discusses the occurrence of *Ullmannia Bronni* Goeppert, *Ullmannia frumentaria* Goeppert, *Voltzia Liebeana* Goeppert, *Baiera digitata* Heer, *Callipteris Martinsii*, and *Sphenopteris* sp., from the Permian in the vicinity of Wehofen in Western Germany.—*E. W. Berry.*

1990. GROVES, J. **A curious fossil Charaphyte fruit.** Geol. Mag. 57: 126–127. *1 fig.* 1920.—Describes specimens of what is probably *Chara merianii* Braun from the Miocene of Locle, Switzerland, showing uniform tubular calcareous hollows on the inner side of the spiral cells that form the oogonium sac.—*E. W. Berry.*

1991. GUPPY, H. B. **Fossil botany in the Western World: an appreciation.** Amer. Jour. Sci. 49: 372–374. May, 1920.

1992. KNOWLTON, F. H. **Evolution of geologic climates.** Bull. Geol. Soc. Amer. 30: 499–566. 1920.—Discusses the factors that might explain the prevailing uniformity of geologic climates, gives an extended summary of the bearing of fossil plants on past climatic conditions, and concludes that the most probable explanation is earth control, the result of internal heat, and not solar control which dominates existing climatic distribution.—*E. W. Berry.*

1993. Newton, B. R. **On some freshwater fossils from Central South Africa.** Ann. and Mag. Nat. Hist. 5: 241–249. *Pl. 8.* 1920.—The author describes three specimens of chalcedonized rock found at the base of Kalahari Sand in Matabeleland in Central South Africa. These rocks, representing the first fossils found in this region, contain oogonia and stems of *Chara* and some remains of Gastropods. A more technical description of the *Chara*, including dimensions, is given by Mr. James Groves; but no specific names are mentioned except one oogonium is said to resemble *Chara hipida*. Although the collection is small, the author thinks the combination of *Chara* and Gastropods indicates a correlation between these rocks and the Intertrappean beds of India, and that therefore they belong to the Upper Cretaceous period.—*Harold H. Clum.*

1991. Picquenard, Ch. **Sur la flore fossile des bassins houillers de Quimper et de Kergogne. [The fossil flora of the coal beds of Quimper and Kergogne.]** Compt. Rend. Acad. Sci. Paris 170: 55–57. 1920.—A list of fossil plants from each of the coal beds named in the title, based on material collected by the author and by others. From the Quimper beds sixteen species are given which in general agree with the flora at the base of the Stephanian stage. Twenty-four species are given from the coal beds of Kergogne, many of which had been previously reported from Blanzy and Commentry. Not any new species are described.—*C. H. and W. K. Farr.*

1995. Principi, P. **Filiti wealdiane della Tripolitania. [Wealden fossils from Tripoli.]** R. Ufficio Geol. Mem. descritt. Carta Geol. d'Italia 18: 71. *2 pl.* 1919.—The engineer Zaccagna in a study of the hydrology of western Tripoli in 1914 collected fossil plants in the vicinity of Seck-Scink and Fessato from clay shales of Wealden age including specimens of *Cladophlebis Albertsii* (Dunker) Brongniart, *Dioonites Buchianus* (Ettings.) Bornm., *Sphenolepidium Kurrianum* (Dunker) Heer, somewhat uncertain remains of *Becklesia anomala* Seward, *Cladophlebis zaccagnai* Principi, and *Yuccites* sp. ind. resembling *Yuccites schimperianus* Zigno of the Jurassic of Verona.—*R. Pampanini.*

1996. Sernander, R. **Subfossile Flechten. [Subfossil lichens.]** Flora 112: 703–724. *7 fig.* 1918.—The absence of fossil lichens in strata earlier than the Tertiary has been attributed to the rapidity of their decomposition. Observations on *Alectoria jubata* (L.) Ach. in Lapland show that all traces of the plant disappear within a year after it falls on the forest floor. Remains of lichens do not occur in ordinary humus, except as fragments. But a study of post-glacial peat-beds shows recognizable remains of such species as *Cladonia rangiferina* (L.) Web., *Cetraria islandica* (L.) Ach., and *Peltigera canina* (L.) Willd. On partially fossilized tree-trunks, *Opegrapha atra* Pers. is present. Calcareous tufa shows such pitting as is characteristic of *Lecidea immersa* (Web.) Ach. The author believes that these observations prove the possibility of lichens becoming fossilized.—*L. W. Riddle.*

1997. Walcott, Charles D. **Cambrian geology and paleontology. IV. No. 5. Middle Cambrian algae.** Smithsonian Misc. Coll. 67[5]: 217–260. *Pl. 43–59.* 1919.—*S. F. Blake.*

1998. Wieland, G. R. **The Tetracentron-Drimys question.** Amer. Jour. Sci. 49: 382–383. May, 1920.—Comments on the question of whether these genera are primitive or reduced, upholding the former view and considering it as conforming to the hypothesis that the Angiosperms are descended from the Cycadeoids through the Ranalian plexus.—*E. W. Berry.*

1999. Wieland, G. R. **Distribution and relationships of the cycadeoids.** Amer. Jour. Bot. 7: 154–171. *Pl. 7, 6 fig.* 1920.—Author believes that forests of microphyllous and small-stemmed cycadeoids were very numerous in Triassic and Jurassic times. *Williamsoniella* and *Wielandiella* are examples of such plants. They probably shed their leaves with the seasons and were able to thrive in temperate climates. Apparently the climates of the Mesozoic were by no means uniformly tropical. The distribution of cycadophytes in the Mesozoic is briefly considered. Author discusses the relationships which the cycadeoids bear to the cycads, the seed ferns, the cordaites and *Dolerophyllum*, the ginkgos, *Araucaria*,

the abietineans, and the Dicotyls and Gnetales. He believes that the cycadeoids gave rise to the angiosperms, and combats the theory of a gentalean origin for the latter group. He suggests that the main plant groups go very far back geologically and have evolved side by side.—*E. W. Sinnott.*

2000. WIELAND, G. R. [Rev. of: SEWARD, A. C. **A text-book for students of botany and geology.** Vol. 4. Price 1£/1s. University Press: Cambridge, 1919.] Amer. Jour. Sci. **49**: 223-224. Mar., 1920.

PATHOLOGY

G. H. COONS, *Editor*
C. W. BENNETT, *Assistant Editor*

2001. ANONYMOUS. **Lime sulphur spray following Bordeaux.** New Zealand Jour. Agric. **19**: 371-374. 1919.—It has been reported that lime-sulphur spray following Bordeaux caused russeting of the fruit. Experiments conducted in two orchards indicated that most of the russeting was due to Bordeaux.—*N. J. Giddings.*

2002. ANONYMOUS. **Compatibility of spray mixtures.** New Zealand Jour. Agric. **19**: 244-245. 1919.

2003. ANONYMOUS. **Index to American mycological literature.** Mycologia **12**: 112-114. 1920.

2004. ANONYMOUS. **Treatment of Armillaria with iron sulphate.** Agric. Gaz. New South Wales **31**: 60. 1920.

2005. ANONYMOUS. **Shothole fungi which affect cherry trees.** Jour. Dept. Agric. South Australia **23**: 31. 1919.—A brief summary of the results of spray tests with Bordeaux, Burgundy and lime-sulphur mixture for the control of the shothole fungus (*Coccomyces hiemalis*). Bordeaux mixture gave good control, Burgundy mixture fair, while lime-sulphur mixture gave no control.—*Anthony Berg.*

2006. ANONYMOUS. **The skin spot disease of potato tubers (Oospora pustulans).** [Abridged and slightly modified account of: OWEN, Miss M. N. **Skin spot disease of potato tubers.** Kew Bull. Misc. Inf. (London) 1919¹. 1919.] Jour. Ministry Agric. Great Britain **26**: 1245-1250. 1920.

2007. ANONYMOUS. **The Christmas tree. (Nuytsia floribunda.)** Australian Forest. Jour. **3**: 10-13. 1920.—This paper discusses the parasitism and root system of *Nuytsia floribunda* which is found always close to banksia or eucalypts, mostly jarrah. The parasite, through the parenchymatous haustoria which develop on the haustoriogen (a continuous fleshy ring encircling the root of the host), obtains an additional supply of organic materials.—*C. F. Korstian.*

2008. ANONYMOUS. **Our botanical immigrants.** Sci. Amer. Monthly **1**: 317-319. *5 fig.* 1920.—A popular article on the quarantine regulations of California.—*Chas. H. Otis.*

2009. ANONYMOUS. **Effect of decay on wood pulp.** Sci. Amer. Monthly **1**: 247. 1920.

2010. ARNAUD, G. **Sur un mode de traitement de la chlorose.** [**A method for treatment of chlorosis.**] Bull. Soc. Path. Veg. France **6**: 136-146. *2 fig.* 1919.—Treatment of chlorosis of pears, poplars, roses, etc., due to an excess of lime, by the injection of sulphate of iron in the trunks and large branches is described. A branch of a chlorotic pear, as a result of this treatment, became green in eight days and is still normal after four years. In some cases

slight injury was caused by an excessive dose or the treatment of too small branches. The following formula was used: powdered iron sulphate 35 to 40 grams used with 20 grams olive oil.—*C. L. Shear.*

2011. Averna-Saça, R. **Molestias da macieria.** [**Diseases of apple.**] Bol. Agric. [São Paulo] 19: 430–433. *1 fig.* 1918.—**Diseases caused by** *Ascochyta* **sp.,** *Pleospora herbarum*, **and** *Sphaerella pomicola.*—*D. Reddick.*

2012. Bancroft, Wilder D. [Rev. of: Peters, Charles A. **The preparation of substances important in agriculture.** 3rd ed. *19×14 cm., vii+81 p.* John Wiley and Sons, Inc.: New York, 1919. $0.80.] Jour. Phys. Chem. 23: 444. 1919.—See Bot. Absts. 5, Entry 1100.

2013. Barker, B. T. P. **Diseases of plants and their treatment.** Jour. Bath and West and South Counties Soc. V, 12: 189–193. 1917–18.—Record of the occurrence of tomato collar rot, a root disease of Belladonna (*Phytophthora*), a bacterial disease of plum trees (hitherto undescribed), a disease of alder (*Fomes igniarius* and *Polyporus sulphureus*), and potato "rust" disease. The following diseases are being investigated: Rhizoctonia of asparagus, apple leaf scorch, apple fruit spot disease and tomato collar rot.—*J. I. Lauritzen.*

2014. Barker, B. T. P., and C. T. Gimingham. **Further experiments on the Rhizoctonia disease of asparagus.** Jour. Bath and West and South Counties Soc. V, 12: 130–134. *1 fig.* 1917–1918.—This is an account of a second series of experiments with soil treatments for *Rhizoctonia violacea*, var. *asparagi* (*R. medicaginis*). For convenience carrots were used in this test also in place of asparagus. The results obtained fully corroborate those of the previous season. The disease was reduced to a mere trace on the plot where bleaching powder was applied (2 ounces per square yard) towards the end of the second week in April, i.e., a few weeks before the test crop was sown. On the check plot the disease was very severe. A considerable importance is attached to the time of application of soil fungicides, that is in the case of *Rhizoctonia* not until the soil temperature begins to rise and the young growth of mycelium makes a good start.—*M. Shapovalov.*

2015. Bastin, S. L. **Some serious potato diseases.** Jour. Bath and West and South Counties Soc. V, 12: 88–106. *8 pl.* 1917–18.—The following diseases of potato are described and control measures suggested: late blight, scab (common), powdery scab, wart disease, Rhizoctonia scab, stalk disease (*Sclerotinia sclerotiorum*), Botrytis disease and black leg.—*J. I. Lauritzen.*

2016. Biers, P. **Le parasitisme probable des Coprins.** [**The probable parasitism of Coprinus.**] Bull. Soc. Path. Veg. France 6: 159–160. 1919.—*Coprinus domesticus* a close relative of *C. radians* was found associated with a disease of *Broussonetia papyrifera* and is regarded as a probable parasite.—*C. L. Shear.*

2017. Bokker, [—]. **Der Kleekrebs.** [**Clover stem-rot (Sclerotinia trifoliorum).**] Illustrierte Landw. Zeitg. 39: 402. *Fig. 310.* 1919.

2018. Boyer, G. **Études sur la biologie et la culture des champignons supérieurs.** [**Biology and culture of higher fungi.**] Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 233–344. *Pl. I–IV, 80 fig.* 1918.—See Bot. Absts. 5, Entry 1931.

2019. Brittlebank, C. C. **The Iceland poppy disease.** Jour. Dept. Agric. Victoria 17: 700–701. 1919.—A brief note discussing the occurrence of a species of *Phytophthora* on Iceland poppy (*Papaver alpinum*).—*J. J. Skinner.*

2020. Bronfenbrenner, J., W. T. Bovie, and Estelle M. Wolff. **A simple arrangement for measuring the rate of heat penetration during sterilization.** [Abstract.] Absts. Bact. 3: 6. 1919.—"A detailed description of the apparatus, with drawings, will appear in the Journal of Industrial and Engineering Chemistry."—*Author.*

2021. BRUNER, ESTEBAN. **La pudrición negra del cacao. [Black rot of the cacao.]** Revist. Agric. Com. y Trab. 2: 630. *1 fig.* 1919.—The black rot of the cacao (*Theobroma cacao*) caused by the fungus (*Phytophthora faberi* Maublanc) is reported for the first time from Cuba. The disease is described and methods of control are recommended.—*F. M. Blodgett.*

2022. BUNTING, R. H. **Report of the Mycologist.** Rept. Agric. Dept. Gold Coast 1917: 19–21. 1918.—Progress report of work on diseases of cocoa, coffee, para rubber.—*J. I. Lauritzen.*

2023. BUTLER, E. J. **Report of the Imperial Mycologist.** Sci. Rept. Agric. Res. Inst., Pusa 1918–19: 68–85. 1919.—The report records progress made during the year under report in the study in India of: black band of jute (*Corchorus*) caused by *Diplodia corchori;* diseases of rosaceous plants in the outer Himalayas; various diseases of chili (*Capsicum* spp.); *Pythium* disease of ginger, tobacco (*Nicotiana* spp.), and *Carica papaya;* wilt of *Cajanus indicus;* smut of sugar cane (*Saccharum officinarum*); and wheat rust. Methods of treatment and prevention are recommended.—*Winfield Dudgeon.*

2024. CALL, L. E. **Director's Report.** Kansas Agric. Exp. Sta. 1917–18. *63 p.* 1918.—Physiological investigations with sorghum (*Andropogon sorghum*) and corn varieties, showing their comparative drought resistance and water requirements is discussed. Kanred wheat, P1066 and P1068, three hard winter wheats, products of the Kansas Station, have been shown to be very resistant to stem rust, *Puccinia graminis tritici.* The effect of stem rust on the grain of other varieties grown in the same plots with above wheats, is shown in contrast. A new form of stem rust *Puccinia graminis tritici-inficiens* is described. Under corn smut (*Ustilago zeae*) investigations it has been shown that although the smut can be reduced by fungicides, it likewise proportionately reduces the yield. Ecological studies show that infection is local through leaf axils and not systemic. A varietal test of sorghums shows that all are susceptible but milo and feterita. The last named are being studied with a view of discovering what constitutes their resistance. [See also Bot. Absts. 5, Entry 1466.]—*L. E. Melchers.*

2025. CHASSIGNOL, F. **La rouille grillagée du poirier (Roestelia cancellata Rebent.) et le Juniperus sabina L. [The pear rust (Roestelia cancellata Reb.) and Juniperus sabina L.]** Bull Soc. Path. Veg. France 6: 133. 1919.—To show the difference in susceptibility of varieties the following case is given. Duchess of Angouleme pear 25 meters from a Juniper had about one-third of its leaves attacked by the *Roestelia,* while an unknown variety only 20 meters from the tree had only four or five leaves affected.—*C. L. Shear.*

2026. COKER, W. C. **A parasitic blue-green alga.** Jour. Elisha Mitchell Sci. Soc. 35: 9. 1919.—Given at the Eighteenth Meeting of the North Carolina Academy of Science, and abstracted in its Proceedings. Oogonia of *Saprolegnia anisospora* were found to be infected by a species of blue-green alga which destroyed the eggs within.—*W. C. Coker.*

2027. COTTON, A. D. **Clover stem-rot (Sclerotinia trifoliorum).** [Rev. of: AMOS, A. Clover stem-rot. Jour. Roy. Agric. Soc. England 79: 68–88.] Jour. Ministry Agric. Great Britain 26: 1241–1244. 1920.

2028. COTTON, A. D., AND M. N. OWEN. **The white rot disease of onion bulbs.** Jour. Ministry Agric. Great Britain 26: 1093–1099. 1920.—The white rot disease of onions, very widespread in England and known to occur in Scotland and Ireland, causes considerable damage to the onion crop, especially in market gardens and allotments, and is caused by *Sclerotium cepivorum.* It attacks both spring and autumn sown onions and is most in evidence from the beginning of June to early August. Few infections appear to take place after that date. In attacked plants the leaves turn yellow, wilt, fall over, and finally the entire plant collapses and is easily pulled from the ground. Under warm, moist conditions a fluffy, white mycelium develops round the base of the bulb which is very characteristic of the White Rot disease and distinguishes it at once from all other diseases of the onion. A little later the

surface of the bulb shows the presence of numerous black spherical sclerotia about the size of small poppy seed (0.5 mm. in diameter). The sclerotia appear to persist in the soil at least three or four years and may survive considerably longer. The disease is introduced into new localities by contaminated soil and manure, diseased seedlings and "sets." All common varieties are susceptible. Shallots are usually very resistant as is also true of leeks. The only present known means of control is to keep the infected ground free from onions and allied crops for a number of years. Soil fungicides have not proved effective.—*M. B. McKay.*

2029. CULHAM, A. B. **Report on the agricultural station, Aburi.** Rept. Agric. Dept. Gold Coast 1917: 24–29. 1918.—Includes a note, with table, on distribution of cocoa diseases.—*J. I. Lauritzen.*

2030. DARNELL-SMITH, G. P. **An account of some observations upon the life-history of Phoma citricarpa McAlp. The cause of the "Black Spot" disease in Citrus fruit in New South Wales.** Proc. Linnean Soc. New South Wales 43: 868–882. *Pl. 84–90.* 1918.—The paper first presents a brief historical review of the fungus and the disease. This is followed by a statement of the general symptoms. The disease is serious in New South Wales, producing minute black spots on the foliage throughout the year. On the fruits the spots are rarely seen before the first of August, and vary from ¼ to ½ inch or more in diameter. The disease appears almost invariably on the sunny side of the tree and on the side of the fruit exposed to the sun. This has been checked up experimentally and is explained as being due to the lowering of vitality by action of the sun.—Culture data are given and the structure of the mycelium, spores and pycnidia discussed. Two types of spores were found, large viable ones and smaller ones, termed "X" spores, which do not germinate.—The disease can be controlled with Bordeaux.—*C. J. Humphrey.*

2031. DOIDGE, ETHEL M. **The rôle of bacteria in plant diseases.** [Presidential Address, South African Assoc. Adv. Sci., Kingwilliamstown, July, 1919.] South African Jour. Sci. 16: 65–92. 1919.—This is a review of the history of plant bacteriology and a summary of present knowledge of the rôle of bacteria in plant diseases with special reference to South African conditions and to diseases of plants occurring in South Africa.—*E. M. Doidge.*

2032. DUYSEN, F. **Wurzelbrand im Weizenschlage. [Root-scald in wheat-fields.]** Illustrierte Landw. Zeitg. 39: 372–373. 1919.—The diseases caused by the fungus, *Leptosphaeria culmifraga*, is described and indirect control through increasing the resistance of the host plant by proper fertilization is recommended. Badly diseased fields should be plowed up and replanted with crops other than wheat or rye. Such fields should not be planted with wheat or rye for a term of years.—*John W. Roberts.*

2033. EBERSON, FREDERICK. **A yeast-agar medium for the Meningococcus.** [Abstract.] Absts. Bact. 3: 10. 1919.—See Bot. Absts. 5, Entry 1940.

2034. EKAMBARAM, T. **Suspected parasitism in a moss.** Jour. Indian Bot. 1: 206–211. 6 *fig.* 1920.—During the monsoon season a common unidentified moss in Madras is found with its rhizoids and protonemata penetrating colonies of Cyanophyceae. Because the penetrating rhizoids and protonemata are colorless, and become filled with starch coincidentally with the decay of the alga colonies, the author suggests that the moss is parasitic on the algae. Haustorial connections were not observed.—*Winfield Dudgeon.*

2035. ERIKSSON, JAKOB. **Sur l'hétéroecie et la specialisation du Puccinia caricis, Reb. [On heteroecism and specialization in Puccinia caricis Reb.]** Rev. Gén. Bot. 32: 15–18. 1920. —See Bot. Absts. 5, Entry 645.

2036. ERWIN, A. T. **Hot formaldehyde treatment for potato scab.** Potato Mag. 2[10]: 14. 1 *fig.* 1920.

2037. ERI, A. A. **The true nature of plant diseases.** Amer. Bot. 26: 20–23. 1920.—The author contends that in favorable situations plants produce substances that render them resistant to disease and that if horticulture is properly conducted the plants will ward off disease by becoming immune.—*W. N. Clute.*

2038. FELT, E. P. **New Philippine gall midges.** Philippine Jour. Sci. 14: 287–294. 1919.—This paper is supplemental to one published in the Philippine Journal of Science for 1918. It describes the gall midges and their food habits, but the appearance of the galls is left for a subsequent paper.—*Albert R. Sweetser.*

2039. FERDINANDSEN, C., AND O. WINGE. **A Phyllachora parasitic on Sargassum.** Mycologia 12: 102–103. *2 fig.* 1920.—See Bot. Absts. 5, Entry 1941.

2040. FLETCHER, J. J., AND C. T. MUSSON. **On certain shoot-bearing tumors of Eucalypts and Angophoras, and their modifying influence on the growth habit of the plants.** Proc. Linnean Soc. New South Wales 43: 191–233. *Pl. 4–26.* 1919.—See Bot. Absts. 5, Entry 1888.

2041. FOEX, ET. **Note sur une maladie du poirier. [Note on a pear disease.]** Bull. Soc. Path. Veg. France 6: 102–104. Sept.–Oct., 1919.—A canker on pear branches in France is described and regarded as identical with the disease described by GRIFFON and MAUBLANC, *Diplodia griffoni* Sacc. or *Sphaeropsis pseudo-diplodia* Fckl., the pycnidial form of *Physalospora cydoniae*, was found on the cankers and is regarded as the cause. Cutting out of cankers and spraying with Bordeaux are recommended.—*C. L. Shear.*

2042. FOEX, ET. **Au sujet d'un épi de blé partiellement charbonné. [Regarding a partially smutted head of wheat.]** Bull. Soc. Path. Veg. France 6: 105–106. 1919.—A case is reported in which a head of wheat showed the lower spikelets smutted by *Ustilago tritici* and the upper apparently healthy. Three of the unsmutted grains were grown and produced plants free from smut. It is suggested in explanation that the apparently sound spikelets escaped infection or the infection remained dormant. PEGLION is cited as having examined similar cases partially smutted by *Tilletia caries* without finding traces of mycelium in the unsmutted spikelets. A thorough microscopic examination of such cases is necessary in order to determine with certainty whether a partial or undeveloped infection has taken place.—*C. L. Shear.*

2043. FOEX, ET. **Note sur une maladie de l'orge et de l'avoine. [Note on a disease of rye and oats.]** Bull. Soc. Path. Veg. France 6: 118–124. Nov.–Dec., 1919.—A disease of oats and rye somewhat resembling foot rot is described. A species of Fusarium was found on the diseased stems. This was compared with *F. rubiginosum* and other species reported on grain but no positive identification made. Soil sterilization and burning of all diseased plants are suggested as control measures.—*C. L. Shear.*

2044. FOEX, ET. **Quelques remarques au sujet de la présence de périthèces de Phyllactinia corylea sur des feuilles de Chêne atteintes de "Blanc." [Note on the presence of perithecia of Phyllactinia corylea on oak leaves affected with powdery mildew.]** Bull. Soc. Path. Veg. France 6: 161–166. 1919.—Oak leaves having all the appearance of the mildew attributed to *Microsphaeria quercina* were found to bear perithecia of *Phyllactinia*. Certain peculiarities of the walls of the hyphae of the mildew on the leaves known to occur in *Microsphaeria* but not in *Phyllactinia* lead the author to believe that the perithecia found were not produced on the oak leaves but blown there from some other host.—*C. L. Shear.*

2045. GREENE, LAURENZ, AND I. E. MELHUS. **The effect of crown gall upon a young apple orchard.** Iowa Agric. Exp. Sta. Res. Bull. 59: 147–176. *8 pl., 3 fig.* 1919.—This bulletin deals with the effect of crown gall on a young orchard up until the bearing age. Infected trees were selected and planted on a modified Missouri loess type of soil. The observations extended over a five years period. Crown gall effects were determined by measurements of the trunk diameter, and by consideration of the twigs, their number, length, thickness and weight. The large galls were more injurious than the small ones and those on the stock and union were more harmful than those on the secondary growth.—*I. E. Melhus.*

2046. GROVE, O. **Notes on the fruit blossom bacillus. Investigations on diseases of plants and their treatment.** Jour. Path and West and South Counties Soc. 5, 12: 124–128. 1917–18. —The bacillus (specific name not mentioned) which causes disease of pear blossoms was isolated from several samples of soil and is supposed to be common there in April, but not earlier in the year. Cultures made from the roots of various plants yielded apparently the same organism. An experiment was carried on with plants grown in sterilised soil in pots, one set of which was inoculated with cultures of the bacillus. It was found that the latter had a decided beneficial effect upon the growth of the plants. A description is given of morphological, cultural and some biochemical characters of the bacillus.—*M. Shaposnikov.*

2047. HENDRICK, J. **The use of lime in controlling finger-and-toe in turnips.** Trans. Highl. and Agric. Soc. Scotland V, 30: 137–145. 1918.—The author presents data to show that the application of sufficient lime to neutralize the sourness and leave an excess carbonate of lime in the soil will check or prevent finger-and-toe (*Plasmodiophora brassicae*) in turnips.—*J. I. Lauritzen.*

2048. HESS, E. **Die Mistel auf dem schwarzen Walnussbaum (Juglans nigra). [Mistletoe on the black-walnut (Juglans nigra).]** Schweiz. Zeitschr. Forstw. 71: 1–2. *1 fig.* 1920. —This is the first occurrence of mistletoe on black walnut recorded. It occurred in a park in the village of Champagne, Waadtländer Zura. A possible explanation for its occurrence on this species is the less astringent sap as compared to other nut trees. The mistletoe is supposed to have been disseminated from nearby fruit trees.—*J. V. Hofmann.*

2049. HONNET, G. **Les hybrides en 1919. [1919 hybrids.]** Rev. Vitic. 22: 53–59. 1920.—See Bot. Absts. 5, Entry 1744.

2050. HOWARD, ALBERT. **Spike disease of peach trees: an example of unbalanced sap-circulation.** Indian Forester 45: 611–617. 1919.—The characteristics of the spike disease of sandalwood are similar to those of the peach. When the peach is budded on the almond, unless there is close junction between bud-ring and seedling, there is a delayed union and a callus tissue forms until the stock and scion are united. In the former case when the union is perfect, the tree grows normally and vigorously; in the latter case development is slow and the tree becomes "spiked," with the characteristics of form and of mineral and starch content very similar to the sandal. It is suggested that the spike of sandal may be due to the imperfect union of the root haustoria with the host.—*E. N. Munns.*

2051. HUBERT, ERNEST E. **Disposal of infected slash on timber-scale areas in the northwest.** Jour. Forestry 18: 34–56. 1920.—Factors of available water and food supply, resistance of the host to sporophore production, temperature, humidity and light are most important in the production of sporophores of wood-destroying fungi. These may be present in the slash of cut-over areas and all the destructive wood-rotting fungi can develop on infected slash. These are sources of infection to the remaining trees of the stand. Slash should be burned or charred as far as possible or otherwise dragged into openings where the soil and air is drier and warmer. This is not so important with the yellow pines as with the firs and cedars because of the moister sites occupied by the latter.—*E. N. Munns.*

2052. KERN, FRANK D. **Report of the botanist.** Bull. Pennsylvania Dept. Agric. 1[1]: 24–26. 1918.—Attention is called to the greater need for practicing the methods which have already been worked out for the control of crop diseases. Statistics are given on the losses to the oat, potato and apple crop occasioned by plant disease during the season 1917.—*C. R. Orton.*

2053. KLEBAHN, H. **Haupt- und Nebenfruchtformen der Askomyzeten. Erster Teil: Eigene Untersuchungen. [Perfect and imperfect stages of ascomycetes.]** *395 p., 275 fig.* Gebr. Bornträger: Leipzig, 1918.

2054. KOERNER, W. F. **Auf welche Krankheitsformen ist beim "Durchsehen" und "Aushauen" der zur Saatgewinnung bestimmten Kartoffelfelder besonders zu achten. [What diseases are to be considered especially in going through and thinning out potato fields from which seed potatoes are to be selected.]** Illustrierte Landw. Zeitg. 39: 323-324. *Fig. 258-259.* 1919.

2055. KORNAUTH, K. **Bericht der K. K. landwirtschaftlich-bakteriologischen und Pflanzenschutzstation in Wien für das Jahr 1917. [Report for 1917, of the Vienna institute for agriculture, bacteriology and plant protection.]** Zeitschr. landw. Versuchsw. Österr. 21: 377-393. 1918.—Occurrence of potato black leg and an early severe outbreak of blight (*Phytophthora infestans*), tomato rot caused by *Phytobacter lycopersicum*, core rot of apple caused by *Fusarium putrefaciens* and a disease of *Picea pugens* caused by *Cucurbitaria piceae*.—Seeds of cucumber, onion and bean were tested for tolerance to a variety of proprietary disinfectants.—"Bosnapasta is a satisfactory preventive of cucumber mildew (*P. cubensis*) and scab (*Cladosporium*). [Through abst. by MATOUSCHEK in Zeitschr. Pflanzenkr. 29: 241-242. 1919 (1920).]—*D. Reddick.*

2056. LEE, H. ATHERTON, AND HARRY S. YATES. **Pink disease of citrus.** Philippine Jour. Sci. 14: 657-671. *7 pl., 2 fig.* 1919.—The disease is caused by *Corticium salmonicolor* B. & Br. At present localized in a small area, hence the importance of a description of the disease and the method of eradication to prevent further spread. The method of dissemination is studied and recommendations are made for its treatment with lime sulphur spray.—*Albert R. Sweetser.*

2057. LEES, A. H. **"Reversion" of black currants.** Jour. Bath and West and South Counties Soc. 5, 12: 134-135. 1917-1918.—An explanation is given as to the probable causes of an abnormal lateral growth in currants, known as big bud or reversion. It is said to be due to a check in terminal growth of which two cases were observed: the mite-checked terminal and the formation of a terminal flower. The latter was found to occur on shoots that were making a comparatively weak growth.—*M. Shapovalov.*

2058. LEES, A. H. **Further experiments on big bud mite.** Jour. Bath and West and South Counties Soc. 5, 12: 137-139. 1917-1918.—Experiments were conducted to determine the number of sprays necessary for the control of the big bud mite, and the best time for their application. It was found that 2 applications give better results than one and possibly 3 are necessary. The following months were selected: (a) beginning of December, (b) beginning of January and (c) end of February. A satisfactory control was obtained with a mixture containing 10 per cent of soap and 5 per cent of crude carbolic acid.—*M. Shapovalov.*

2059. LEES, A. H. **Copper stearate.** Jour. Bath and West and South Counties Soc. 5, 12: 139-142. 1917-1918.—A proper combination of soap and copper sulphate, called for convenience copper stearate, possesses high wetting and spreading properties. Ordinarily both Burgundy and Bordeaux mixtures alone are deficient in these qualities. The wetting powers of the copper soap mixture may be greatly increased by combining it with a 2 per cent paraffin emulsion [kerosene].—*M. Shapovalov.*

2060. LEVY, E. BRUCE. **Investigation of dry-rot in swedes.** New Zealand Jour. Agric. 19: 223-228. 1919.—A dry rot disease of swede turnips (*Brassica campestris*) is serious in certain sections and is frequently followed by soft rot. The article deals only with direct control measures. The effects of various fertilizer combinations were tried and a superphosphate-guano mixture seemed to give a slight improvement. Seed from different sources gave little variation in the amount of disease. A large number of varieties were tested and some were found to be slightly resistant. Selection of resistant plants for seed is to be practiced.—*N. J. Giddings.*

2061. LEWIS, A. C. **Annual Report of the State Entomologist for 1919.** Georgia State Bd. Entomol. Bull. 55. *31 p. Fig. 2.* 1920.—Contains a statement of the work conducted by the Georgia State Board of Entomology, one of the main lines having been the dusting of

peaches (*Amygdalus persica*) against diseases and insects. In the garden and truck work, spraying against the Mosaic disease of peppers (*Capsicum annuum*) was undertaken. Black Leaf 40 was used against the plant lice in an effort to prevent spread of the trouble. Experiments appeared successful, but it was found hard to control the lice. This work will be continued.—The breeding of cotton (*Gossypium hirsutum*), the testing of varieties and the growing of wilt resistant strains were part of the activities of the Board during 1918.—Two new insects were reported in Georgia, one being a species of Margarodes and the other the Chrysanthemum Midge (*Diarthronomyia hypogaea*). The latter part of the report contains a list of the Georgia nurseries inspected for 1918–1919.—*T. H. McHatton.*

2062. Lloyd, C. G. **Mycological notes, No. 61.** *P. 877–993, pl. 124–139.* Cincinnati, Ohio, 1919.—See Bot. Abstr. 5, Entry 1959.

2063. Matz, Julius. **Algunas enfermedades del follaje en las plantas. [Foliage diseases.]** Revist. Agric. Com. y Trab. 2: 624–625. 1919.—Reprinted from Revist. Agric. Puerto Rico.

2064. McKay, M. B. **Verticillium wilt of potatoes in Oregon.** Potato Mag. 2[4]: 10–11, 38, 42. *5 fig.* 1919.—*V. alboatrum* may be present in apparently healthy tubers and absent in tubers with discolored strands. It may survive a winter in either end of a tuber from a diseased hill, or in trash from diseased plants in the soil. The fungus first attacks the small roots. It spreads through the soil along the row. Infection in 90 per cent of the hills reduced the yield by 32.5 per cent.—*Donald Folsom.*

2065. McRae, W. **Administration report of the Government Mycologist for the year 1917-18.** Rept. Dept. Agric. Madras 1917-18: 77–80. 1918.—A progress report of the work being done on miscellaneous diseases is given.—*J. I. Lauritzen.*

2066. Melhus, I. E., and L. W. Durrell. **Cereal rusts of small grains.** Iowa Agric. Exp. Sta. Circ. 62. *15 p., 11 fig.* 1919.—The five different rusts commonly attacking the small grains are described in a popular manner. The time of appearance of stem rust (*Puccinia graminis*) in the spring and its spread from the common barberry (*Berberis vulgaris*) is shown in tabular and graphic form. During the past two years (1917 and 1918) a great many barberry bushes have been found in the state growing as hedges in the country and town or as clump plantings on public and private grounds in the cities. Previous to 1917, all of the nurseries in the state carried extensive plantings for distribution. In some cases these plantings covered five acres. In addition to being domesticated, this shrub is at present tending to run wild in some localities, 20 such places having been found. Data at hand show that in 1917 before the barberry eradication movement was begun, there were in Iowa at least a million bushes. Their distribution was general over the state, and they were found in every county, although the largest numbers were found in the larger cities. The relation of crown rust to the various species of buckthorn (*Rhamnus*) in the state is explained. There are three species of buckthorn in Iowa. Two of them have been introduced from Europe and are sold by nurserymen for ornamental and hedge purposes. These are *Rhamnus cathartica* and *R. frangula*. The latter species is very resistant to the alternate stage of crown rust.—*I. E. Melhus.*

2067. Melhus, I. E., and L. W. Durrell. **Studies on the crown rust of oats.** Iowa Agric. Exp. Sta. Res. Bull. 49: 115–144. *6 fig.* 1919.—A progress report dealing largely with factors influencing the growth and reaction of crown rust on oats and different species of *Rhamnus*. The minimum, optimum and maximum temperatures for urediniospore germination are given. The per cent of germination of urediniospores produced in the greenhouse is variable. Urediniospores must be in direct contact with water in order to germinate. Vaseline and paraffine oil in contact with water acted as stimulants. The special form of crown rust on oats uses *Rhamnus cathartica* and *R. lanceolata* as alternate hosts. *R. frangula, R. caroliniana* and *R. alnifolia*, according to the data presented, do not harbor the secial stage of crown rust of oats.—*I. E. Melhus.*

2068. MIOVIĆ AND ANDERLIĆ. **Über Tomatener krankungen. [Tomato diseases.]** Zeitschr. landw. Versuchsw. Österr. 21: 407–415. 1918.—*Phytophthora infestans* and *Gloeosporium phomoides* attacked tomatoes in Dalmatia. The latter fungus attacked only the variety Ficarazzi causing wrinkled, unmarketable fruit. The diseases were controlled by 4 applications of 1 per cent Bordeaux mixture the first application being made in the hot-bed. [Through abst. by MATOUSCHEK in Zeitschr. Pflanzenkr. 29: 253–254. 1919 (1920).]—*D. Reddick.*

2069. MIRANDE, ROBERT. **Sur une maladie de la Coque de Noix. [A disease of the shell of walnut (Juglans regia).]** Bull. Soc. Path. Veg. France 6: 134–136. *Pl. 1, 6 fig.* Nov.–Dec., 1919.—Nuts of *Juglans* (cultivated) from certain trees show thin places or irregular lesions penetrating the shell. No insect or fungus was associated with the trouble and it is regarded as a physiological disorder or degeneration. It is confined to certain trees which show the disease each year.—*C. L. Shear.*

2070. MOESZ, G. **Mykologiai Közlemények. III. Közlemény. [Mycological investigations. III.]** Bot. Közl. 17: 60–78. *11 fig.* 1918.—See Bot. Absts. 5, Entry 1962.

2071. MOESZ, G. **Megjegyzés Schilbersky K.—nak a fekete á gabonarozsda tárgyában tett javaslatához. [Remarks on Schilbersky's lecture on black rust of cereals.]** Bot. Közl. 17: 49–51. 1918.—Review of facts concerning overwintering of *Puccinia graminis* and rôle of barberry in its perpetuation and dissemination. Suggests that critical study be made before restrictive measures of the more northerly countries are adopted in Hungary. [Through abst. by MATOUSCHEK in Zeitschr. Pflanzenkr. 29: 255–256. 1919 (1920).]—*D. Reddick.*

2072. MUNN, M. T. **The seed analyst's responsibility with reference to seed-borne plant diseases.** Proc. Assoc. Official Seed Analysts of North America 1919: 31–35. 1919.

2073. NICHOLLS, H. M. **Annual report of the Government Microbiologist.** Tasmania Agric. and Stock Dept. Rept. 1916–17: 20–23. 1917. [Appeared, 1918.]—"Owing to the phenomenally wet season, fungous diseases of all kinds were very common in fruit and other crops." Apple scab, "powdery mildew or fire blight," black rot (*Sphaeropsis malorum*) abundant and destructive on apples. *Puccinia pruni* injured stone fruits, generally, including apricots; *Coryneum beyerinckі* also was injurious to stone fruits causing shot-hole. Potato blight [*Phytophthora*] was widespread and losses ranged up to 100 per cent. Experiments for the control of a pea disease, caused by *Rhizoctonia*, are reported but were practically without result owing to wet weather. *Peronospora viciae* does some damage to peas.—Iron sulfid spray gave satisfactory control of apple mildew. [See also next following Entries, 2074, 2075.]—*D. Reddick.*

2074. NICHOLLS, H. M. **Annual report of the Government Microbiologist.** Tasmania Agric. and Stock Dept. Rept. 1917–18: 13–16. 1918.—Diseases much less prevalent than previous year on account of dry season. In addition to notes on apple diseases and potato blight, *Fusarium solani* is reported as the cause of a destructive potato wilt. [See also next preceding and next following Entries 2073, 2075.]—*D. Reddick.*

2075. NICHOLLS, H. M. **Annual report of the Government Microbiologist.** Tasmania Agric. and Stock Dept. Rept. 1918–19: 20–23. 1919.—*Oidium lactis* has been found to cause rancidity in butter. Slow pasteurization of cream is effective in prevention.—Potato tubers were subjected to a temperature of 125°F. for 4 hours to kill *Phytophthora.* When planted, they sprouted sooner and more evenly than untreated tubers and made a better crop. Owing to the dry season late blight did not develop in the field. Early blight (*Macrosporium*), wilt (*Fusarium*), scab (*Rhizoctonia*), scurf (*Spondylocladium*), potato moth, and eel-worm were prevalent on potato. *Rhizoctonia* of potato also injures field pea. Fruit diseases occurred as in 1916–17 (see second preceding entry) but were not so serious owing to dry season.—Young apple trees which suddenly wilt and die were found affected with a fungus "identical in every respect with *Fusarium vasinfectum.*" Action of fungus seems to be purely mechanical (throm-

botic). Cold wet springs are favorable to the disease. Trees are very susceptible up to the eighth year. Indications are that fungus gains entrance at time of budding or grafting.—Somewhat similar disease of apricots is said to be caused by *Nectria cinnabarina*.—Differential stain for mycelium of these two organisms in wood is: very weak solution Delafield's haematoxylin, 24 hours, differentiated in ammoniated distilled water. [See also next preceding Entries, 2073, 2074.]—*D. Reddick.*

2076. Nicholson, C. G. **Some vegetable parasites.** Sci. Amer. 122: 87–97. *4 fig.* 1920.—A popular article on flowering plants and fungi that derive nourishment from other plants.—*Chas. H. Otis.*

2077. Osborne, T. G. B. **Black leg disease of cabbages.** Jour. Dept. Agric, South Australia 23: 107–110. *1 fig.* 1919.—The article contains a brief summary of the history of the disease in South Australia. A detailed description of the symptoms, and remedial measures based upon K. P. Henderson's work (Phytopathology 7: *579–631.* 1918) is given.—*Anthony Berg.*

2078. Osborne, T. G. B. **Two serious new wilt diseases.** Jour. Dept. Agric. South Australia 23: 437. 1919.—Two serious wilt diseases hitherto unrecorded in the state have come to the attention of the author. The one a spotted wilt of tomato which develops on the young leaves, leaf stalk and stems in irregular, brown spots and within a few days the whole plant wilts from above downward. The other is a strawberry wilt. Apparently healthy plants wilt within a few hours in hot weather; though seldom killed outright the first season the plants fail to make thrifty growth or to bear fruit. The disease can be spread by planting offshoots from diseased plants. Healthy plants set out in beds that had a diseased crop the previous season become affected.—*Anthony Berg.*

2079. Osmaston, A. E. **Observations on some effects of fires and on lightning-struck trees in the chir forests of the North Garhwali Division.** Indian Forester 46: 125–131. 1920.—Chir forests were badly burned in 1916 and the trees apparently have not been killed by heat directly but through the subsequent action of insects, especially bark beetles, and fungi. Similar action is seen in trees struck by lightning, the infection spreading to surrounding trees in the group. This may be due to electrical disturbances and action on the cambium as well as to external agencies.—*E. N. Munns.*

2080. Osterwalder. **Vom Apfelmehltau.** [Apple mildew.] Schweiz. Zeitschr. Obst. u. Weinbau 1918: 161. 1918.—Sulfur and lime-sulfur solution are worthless for control. Best control is early careful cutting and burning of infected twigs. The following varieties are very susceptible: Parkers Pepping, Orleans- and Landsberger-Reinette, Goldreinette von Blenheim, Boiken. [Through abst. by Matouschek in Zeitschr. Pflanzenkr. 29: 261–262. 1919 (1920).]—*D. Reddick.*

2081. Paine, S. G., and C. M. Haenseler. **Decay in potato clamps due to "black-leg."** Jour. Ministry Agric. Great Britain 27: 78–80, 1920.—Cultural studies indicate that some of the trouble from the rotting of potatoes in out-door storage in Britain during the winter of 1918–19 was due to the "black-leg" organism (*Bacillus atrosepticus*). It is not certain whether it was responsible for the initial injury or whether its presence was general in rotting potatoes throughout the country.—*M. B. McKay.*

2082. Pammel, L. H. **Perennial mycelium of parasitic fungi.** Proc. Iowa Acad. Sci. 25: 259–263. 1920.—The author enumerates many species of fungus with perennial mycelium. Of *Ustilago striaeformis* he states "The purpose of this note is to call attention to the fact that the same stool of timothy will produce the smut for years."—*H. S. Conard.*

2083. Peyronel, B. **Sul nerume o marciume nero delle castagne.** [On the blackening or black rot of chestnuts.] Staz. Sperim. Agrarie Italiane 52: 21–41. *4 pl.* 1919.—A study of the black rot of chestnuts, a condition distinctly recognisable in the ripe fruit but which,

according to the author, is conveyed to the flower at the time of flowering. The causal organism is carefully described and studied in its natural and cultural environments. It is found that the optimum temperature lies between 14°C. and 16°C., while a temperature of 10°C. below 0°C. is not injurious to the organism, although growth is checked during the time of exposure. Higher temperatures than the optimum bring about a luxuriant growth which does not last more than a very few days. On relatively dry media there is the formation of sclerotic tissues that are considered by the author as the adaptations for the tiding over of dry periods rather than cold periods. Microscopically the fungus causing the rot resembles closely the one described by Peglion and by Bainier and with a few differences of a minor importance the incomplete descriptions of the above authors are suited for the description of the present form. Systematically the causal organism has been placed in a newly formed genus under the name *Rhacodiella castaneae* (Banier) Peyronel. Asphyxiation of the fungus which is an obligate aerobe, by means of CO_2 or simple soaking in water for a few days, may prove beneficial if care is then taken to spread the chestnuts to dry in a thin layer in a cool and dry place. Sulphur fumigation was of no avail in the treatment of the fruit. Infected chestnuts being of less specific gravity allows separation from sound nuts by flotation methods.—*A. Bonazzi.*

2084. PRIDHAM, J. T. **An obscure disease in wheat.** Agric. Gaz. New South Wales 31: 229–231. *2 fig.* 1920.—A non-technical description of a wheat trouble is given. Abnormal conditions appear at heading time. Heads have a faded dull appearance, are constricted, and contain shrunken grain. The characters of the disease do not indicate take-all, *Ophiobolus graminis*. Disease not amenable to seed treatments used. Disease has been noticed at points in New South Wales since 1911 but nearly absent several years.—*L. R. Waldron.*

2085. RAMBOUSEK. **Über die praktische Anwendung des Sulfins gegen Schimmelpilze und Schädlinge. [On the applicability of Sulfin for fungous diseases and insect pests.]** Zeitschr. Zuckerind. Böhmen **42**: 649. 1918.—Sulfin is a new proprietary powder containing sodium bisulfate and gypsum. Results secured thus far are satisfactory and the material is worthy of further test. [Through abstract by MATOUSCHEK in Zeitschr. Pflanzenkr. **29**: 280. 1919 (1920).]—*D. Reddick.*

2086. RAVAZ, L. **Traitement de l'Anthracnose. [Control of the anthracnose.]** Prog. Agric. et Vitic. **74**: 103–104. 1920.

2087. REINKING, OTTO A. **Phytophthora Faberi Maubl.: The cause of coconut bud rot in the Philippines.** Philippine Jour. Sci. **14**: 131–151. *5 pl.* 1919.—The history, distribution, and nature of the disease are outlined, followed by detailed description of field and laboratory studies of the disease. The indications pointed to bacterial agency and an organism resembling *Bacillus coli* was isolated. Inoculations with pure cultures of *Bacillus coli* produced many symptoms of the disease. Bacterial causation, however, was deemed insufficient to account for the rapid dissemination. Trees inoculated with Phytophthora isolated from Cacao proved positive in a large percentage of cases. Later the same fungus was isolated from the woody tissue of the coconut and reinfections proved it to be the cause of bud rot. A taxonomic study revealed the presence of several species of the fungus. Methods of treatment recommended and a bibliography is appended.—*Albert R. Sweetser.*

2088. ROSEN, H. R. **The mosaic disease of sweet potatoes.** Arkansas Agric. Exp. Sta. Bull. 167. *16 p., 5 pl.* 1920.—The mosaic disease of sweet potatoes was first identified by the author in 1918 and has since been the subject of study. Isolation and infectivity studies have been carried on, so far with negative results. The disease is classified as a non-infectious, heritable chlorosis. The appearance of the disease is described and illustrated. Roguing diseased plants is recommended as a control for the disease.—*John A. Elliott.*

2089. SALMON, S. C. **Establishing kanred wheat in Kansas.** Kansas Agric. Exp. Sta. Circ. 74. *16 p.* 1919.—See Bot. Abstr. 5, Entry 1205.

2090. Sanders, J. G. **A handbook of common garden pests.** Bull. Pennsylvania Dept. Agric. 1²: 1-24. *20 fig.* 1918.

2091. Sanders, J. G., and L. H. Wible. **List of owners of commercial orchards and licensed nurserymen in Pennsylvania including list of registered dealers in nursery stock.** Bull. Pennsylvania Dept. Agric. 1¹⁰: 1-56. 1918.—*C. R. Orton.*

2092. Schellenberg. **Versuche zur Bekämpfung der Peronospora.** [Investigations of control of grape downy mildew.] Schweiz. Zeitschr. Obst- u. Gartenbau 1918: 81. 1918.—Best mixture is 1 per cent copper sulfate, 1 per cent iron sulfate and 1 per cent hydrated lime. Of proprietary mixtures, Martini mixture is preferable to Bordola paste. [Through abst. by Matouschek in Zeitschr. Pflanzenkr. 29: 254-255. 1919 (1920).]—*D. Reddick.*

2093. Schilberszky, K. **Hipertrófos paraszemölesök almagyümölcsökön.** [Hypertrophied lenticels on fruit of apple.] Bot. Közlemények 17: 93. 1918.—The condition is thought to be caused by excessive amount of water in soil. Tissue underlying hypertrophied area appears water soaked. [Through abst. by Matouschek in Zeitschr. Pflanzenkr. 29: 249. 1919 (1920).]—*D. Reddick.*

2094. Schilberszky, K. **Javaslat a fekete gabonarozsda tárgyában.** [A lecture on black rust of cereals.] Bot. Közlemények 17: 43-48. 1918.—Summary in German.

2095. Schönfeld, Leo. **Beizen des Hirsesaatgutes.** [Disinfecting millet seeds.] Wiener landw. Zeitg. 68: 257. 1918.—In Hungary, millet seed is poured through the flame of burning straw to free it from smut. Five per cent copper sulfate is effective but a solution of this strength injures those seeds which are broken in threshing. [Through abst. by Matouschek in Zeitschr. Pflanzenkr. 29: 255. 1919 (1920).]—*D. Reddick.*

2096. Schøyen, T. H. **Betydningsfulde nyere undersøkelser over furuens blaererust.** [Important new investigations on Peridermium pini.] Tidsskr. Skogbruk 28: 28-29. 1920.

2097. Škola, Vlad. **Über die Zusammensetzung der durch Rhizoctonia zersetzten Rübe.** [Composition of sugar beets destroyed by R.] Zeitschr. Zuckerind. Böhmen 42: 135-138. 1918.—Affected tissue contains invert sugar but no saccharose. [Through abst. by Matouschek in Zeitschr. Pflanzenkr. 29: 263. 1919 (1920).]—*D. Reddick.*

2098. Spiekermann. **Der falsche Kartoffelkrebs.** [False potato wart.] Illustr. landw. Zeitg. 1918: 153. 1918.—Lesions have the appearance of true wart. Microscopic examination necessary for diagnosis. Cause of false wart not stated. [Through abst. by Matouschek in Zeitschr. Pflanzenkr. 29: 252. 1919 (1920).]—*D. Reddick.*

2099. Spinks, G. T. **Damping-off and collar rot of tomatoes.** Jour. Bath and West and South Counties Soc. 5, 12: 128-130. 1917-1918.—Both damping-off and collar rot of tomatoes are ascribed to a fungus placed in the genus *Phytophthora*, but the actual species has not been yet identified. From the results of certain studies it is concluded that the fungus is most active and causes most damage in the first 3 or 4 months of the year and that the infection may be carried on from year to year in the soil.—*M. Shapovalov.*

2100. Stevens, F. L. **Foot-rot diseases of wheat—historical and bibliographic.** Bull. Illinois Nat. Hist. Surv. 13: 259-286. 1919.—The recent discovery of a foot-rot disease of wheat in southwestern Illinois (Madison County) and the lack of agreement among American and European pathologists as to the cause of this and similar diseases are the reasons given by the author for presenting this preliminary statement. A brief historical review is given in which attention is called to a wide variance among investigators as to symptoms and causes of foot-rot. These points of disagreement are summarized. The body of the publication consists of a bibliography of 188 titles. In some cases brief abstracts are given.—*H. W. Anderson.*

2101. STUART, G. A. D. **Mycology and operations against disease.** Rept. Dept. Agric. Madras 1917-18: 17-20. 1918.—An account of the progress in the study and control of: secondary leaf fall of *Hevea;* a disease of paddy, variety korangu samba (caused by *Piricularia oryzae);* bleeding disease of coconuts; rot of stored potatoes; Palmyra disease; and Mahali disease on Areca palm nuts.—The cause of secondary leaf fall in *Hevea* is *Phytophthora meadii*, which differs from a somewhat similar fungus reported brom Ceylon.—*J. J. Lauritzen.*

2102. STUCKEY, H. P., AND B. B. HIGGINS. **Spraying peaches.** Georgia Agric. Exp. Sta. Bull. 135: 91-101. 1920.—The bulletin discusses briefly peach diseases and peach insects and recommends formulae for controlling sprays. The effects of commercial lime-sulphur upon peach foliage is discussed, the results being obtained from experiments with six plats of Elberta peaches. Solutions of the following densities were used: 1.003, 1.004, 1.005, 1.006, 1.007, 1.008 specific gravity. Five days after application, the following conditions were found: (1) sprayed with lime sulphur of specific gravities 1.003 to 1.004, not injured; (2) 1.005 burned about 5 per cent of the leaves and these fell from the trees; (3) 1.006 approximately 10 per cent of the leaves injured and fallen; (4) 1.007 and 1.008 did not cause the leaves to fall but burned holes where the droplets of spray collected.—*T. H. McHatton.*

2103. THOMAS, P. H. **Annual report of the Assistant Fruit and Forestry Expert.** Tasmania Agric. and Stock Dept. Rept. 1918-19: 19-20. 1919.—See Bot. Absts. 5, Entry 1777.

2104. THOMAS, ROY C. **A new lettuce disease.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 24-25. 1920.—A brief note is given of the discovery of a disease of lettuce new to Ohio observed in lettuce grown under glass. The causal organism is a bacterium which attacks the roots of the plants gaining entrance when they are young seedlings, or when unfavorable cultural conditions result in a checking of growth. Preliminary investigations indicate that the disease is similar to one previously reported from South Carolina.—*R. C. Thomas.*

2105. UICHANCO, LEOPOLD B. **A biological and systematic study of Philippine plant gall.** Philippine Jour. Sci. 14: 527-554. *15 pl.* 1919.—In the present paper only the galls caused by the action of animals, and known as zoocecidia are taken into consideration, which may be caused by insects and arachnida, as practically no work has been done on the galls in the Philippines. This was a virgin field. Fifty-seven species of galls were described and drawn or photographed and the insects were reared from them.—*Albert R. Sweetser.*

2106. VÖCHTING, HERMANN. **Untersuchungen zur experimentellen Anatomie und Pathologie des Pflanzenkörpers. II. Die Polarität der Gewächse. [Experimental anatomy and pathology of the plant body. II. Polarity.]** *vi + 535 p., 12 pl., 115 fig.* Tübingen, 1918.—Review by O. VON K[IRCHNER] in Zeitschr. Pflanzenkr. 29: 242-249. 1919 (1920).

2107. VON K[IRCHNER], O. [Rev. of: VÖCHTING, HERMANN. **Untersuchungen zur experimentellen Anatomie und Pathologie des Pflanzenkörpers. II. Die Polarität der Gewächse. (Experimental anatomy and pathology of the plant body. II. Polarity.)** *vi + 535 p., 12 pl., 115 fig.* Tübingen, 1918.] Zeitschr. Pflanzenkr. 29: 242-249. 1919 (1920).

2108. WATERHOUSE, W. L. **A note on the over-summering of wheat rust in Australia.** Agric. Gaz. New South Wales 31: 165-166. 1920.—Observations indicated that volunteer wheat plants probably serve as an important medium in carrying over the rust *Puccinia graminis.* Uredinia were formed at intervals during the summer months.—*L. R. Waldron.*

2109. WECK, R. **Saatgutbehandlung der Wintergerste.** [Seed treatment of winter barley.] Illustrierte Landw. Zeitg. 39: 315. 1919.

2110. WHITEHOUSE, W. E. **Cold storage for Iowa apples. (Third progress report.)** Iowa Agric. Exp. Sta. Bull. 192: 181-216. *14 fig.* 1919.—See Bot. Absts. 5, Entry 1787.

2111. Wilcox, E. Mead. **The nature and classification of plant diseases.** Publ. Nebraska Acad. Sci. 10: 5-14. 1920.—We may recognise four great bases for the classification of plant diseases: taxonomy, etiology, morphology, physiology. The paper closes with a two page classification of plant diseases, with examples, under the captions Ontopathology and Phylopathology, relating respectively to functions having to do with the maintenance of life and those concerned with the perpetuation of the species.—*H. S. Conard.*

SUGAR CANE DISEASES

2112. Ashby, S. F. **Mottling or yellow-stripe disease of sugar cane.** Jour. Jamaica Agric. Soc. 23: 344-347. 1919.—A compiled account covering damage caused, distribution, symptoms, varieties attacked, and control measures of the mottling or yellow-stripe disease of sugar cane, now prevalent in Porto Rico and the southern United States. The disease has not been found to date in Jamaica.—*John A. Stevenson.*

2113. Cross, W. E. **The Kavangire cane.** Louisiana Planter and Sugar Manufacturer 63: 397-399. *1 fig.* 1919.—A discussion of the desirable and undesirable qualities of the Kavangire cane, the variety that has been proved to be immune to the mosaic disease, is given. It is a cane very susceptible to frost and drought injury and its small size also makes it expensive to handle.—*C. W. Edgerton.*

2114. Earle, F. S. **The mosaic or new sugar cane disease.** Louisiana Planter and Sugar Manufacturer 63: 167. 1919.—In a criticism of the article of R. M. Grey (Louisiana Planter and Sugar Manuf. 63: 90. 1919), the behavior of the mosaic disease is stated as being often contradictory yet in the main it is capable of causing an immense loss. A cane stalk once affected with the disease never recovers. It is probable that Grey confused the mosaic with other sugar-cane troubles.—*C. W. Edgerton.*

2115. Edgerton, C. W. **Mosaic or mottling disease of sugar cane.** Louisiana State Univ. Div. Agric. Ext. Circ. 32: 1-6. *1 fig.* 1919.—A popular discussion of the mosaic disease of sugar cane, including a description of the disease, varietal susceptibility, distribution and methods of control.—*C. W. Edgerton.*

2116. Edgerton, C. W., and C. C. Moreland. **Effect of fungi on the germination of sugar cane.** Louisiana Agric. Exp. Sta. Bull. 169. *40 p., 9 pl., 2 fig.* 1920.—The average germination of the buds of sugar cane in Louisiana is around 20 per cent. Among the many factors instrumental in causing this low germination is that of the action of several fungi. The common or serious fungi found on deteriorating seed cane in Louisiana, include *Colletotrichum falcatum*, *Melanconium sacchari*, *Gnomonia iliau*, *Marasmius plicatus*, *Thielaviopsis paradoxa* and species of *Fusarium* and *Scopularia*. Of these, *C. falcatum* seems to cause the most loss in Louisiana. Stalks of seed cane inoculated with this fungus at planting time show an average deterioration of about 50 per cent. Stalks that have a heavy infection of the red rot disease, caused by *C. falcatum*, before cutting, do not deteriorate so rapidly when used for seed as stalks that are inoculated after cutting. The other fungi, with the possible exception of a *Fusarium*, are of little economic importance in Louisiana as far as the germination of the buds is concerned. Preliminary tests in "seed" treatment using corrosive sublimate and formaldehyde have given encouraging results.—*C. W. Edgerton.*

2117. Edgerton, C. W., and others. **The mosaic disease.** Louisiana Planter and Sugar Manufacturer 63: 253-255, 350. 1919.—A stenographic report of a discussion at a meeting of the Louisiana Sugar Planters' Association on the mosaic disease of sugar cane.—*C. W. Edgerton.*

2118. Fawcett, G. L. **The yellow-stripe or mosaic disease in the Argentine.** Louisiana Planter and Sugar Manufacturer 64: 41. 1920.—The mosaic disease has been in Argentina for at least fifteen years. In all the sugar provinces except one, it is impossible to find a plant

of a susceptible variety that is free from the disease. The bad effects of this disease seem to be comparatively small as these susceptible varieties have been grown successfully for years. The mosaic disease is not curable and it does not seem to be influenced by the root disease or by fertilization and cultivation.—*C. W. Edgerton.*

2119. GREY, ROBERT M. **The mosaic or mottling disease.** Louisiana Planter and Sugar Manufacturer 63: 199. 1919.—An answer to the communication of F. S. EARLE (Louisiana Planter and Sugar Manuf. 63: 167. 1919). Sugar cane plants affected with the mosaic, and so identified by authorities of the United States Department of Agriculture, recovered from the trouble in 116 days.—*C. W. Edgerton.*

2120. GREY, R. M. **The new cane disease in Cuba.** Louisiana Planter and Sugar Manufacturer 63: 90. 1919.—The mosaic or mottling disease has been in Cuba for a number of years. From observations made at the Harvard Experiment Station, Central Soledad, Cienfuegos, Cuba, the claim is made that the disease causes little or no loss and that stalks will frequently outgrow the trouble. It is believed that the prevalency of the disease is influenced by such weather conditions as rainfall.—*C. W. Edgerton.*

2121. JOHNSTON, JOHN R. **The new cane disease in Cuba.** Louisiana Planter and Sugar Manufacturer 63: 43. 1919.—The mosaic, yellow-stripe, or mottling disease of sugar cane exists in at least three provinces of Cuba. The disease tends to stunt the growth of the cane, causing a decrease in tonnage. The history of the disease in other countries is discussed and the author considers that cane should be prohibited from entering Cuba from the other countries.—*C. W. Edgerton.*

2122. ZENO, RAFAEL DEL VALLE. **"Mottling" or "Yellow Stripe" disease of sugar cane. (Some facts relative to the importance of the discovery of the "morbid" cause.)** Published privately with two colored plates by author. New York, 1919.—Symptoms of the disease are given as a general yellowing of the leaves, which by close inspection is seen to be caused by interrupted streaks, elongated more or less in the direction of the midrib, of a pale green color. Growth of the plants is slow and "closing" of the rows retarded. Development of the canes is more puny than in the healthy plants; the internodes are spindle shaped. Terminal roots are destroyed and the plant can not obtain sufficient nutritive elements from the soil. Good cultivation has no effect on the course of the disease.—"Not because of greater merit than that of my predecessors, but by the chance of having been guided to the right road I can offer today to my country and to all those who have cane plantations the solution of this vital problem, having discovered the cause of 'mottling' and practical methods for raising plantations completely free from this disease and saving the sugar world millions of dollars."—"Cost of the treatment will vary with the class of labor in each locality, method of application (manual or mechanical), number of cuttings per acre, etc., but it is an insignificant sum, possible to be reckoned always as an ordinary expense in raising plantations of cane. Before any sugar planter need pay for the revelation of the secret of this discovery, a series of experiments demonstrating the truth and efficacy of the treatment will be made before a committee composed of competent agronomists and interested planters."—"The committee, composed of Srs. Georgetty, Benitez, D. E. Colon, Wale & Vevc, has stipulated certain conditions to be fulfilled."—The writer makes some general remarks on other diseases, states that the pulling out of diseased stools has no scientific basis and proposes to reveal his secret for a prize. Appended to the paper are credentials consisting of letters of introduction from the governor of Porto Rico, other officials and prominent sugar planters and extracts from statistical reports of the Insular Department of Agriculture, showing decreases in production of sugar from 1916 to 1919.—*E. D. Brandes.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*
E. N. GATHERCOAL, *Assistant Editor*

2123. ALBES, E. **Scented soap from Paraguay oranges.** Sci. Amer. Supplem. 88: 382–383. *5 fig.* 1919. [From the *Pan American Union.*]—Concerns the distillation of oil of petit grain, used for scenting toilet soaps, from the leaves of the bitter orange or bigarrade (*Citrus bigaradia*). There are between 30 and 40 factories operating in Paraguay, employing rather primitive stills. From 500 to 600 pounds of leaves are required to produce about a quart of the ordinary oil of petit grain. The average still will produce about 4 quarts per day. In 1913, the amount of oil exported was 71,322 pounds.—*Chas. H. Otis.*

2124. ANONYMOUS. **A new source of vegetable oil.** Sci. Amer. 122: 399. 1920. [Extract from the Bull. Imp. Inst. United Kingdom Great Britain.]—Note on a semi-siccative oil from the seeds of *Lactuca scariola*, var. *oleifera.*—*Chas. H. Otis.*

2125. BARGELLINI, G. **Sul 1-2-3-triossiflavone. Contributo alla conoscenza della costituzione della Scutellareina.** [**On the 1-2-3-trioxy-flavone. Contribution to the knowledge of the constitution of Scutellarein.**] Gaz. Chim. Italiana 49: 47–63. 1919.

2126. BARGELLINI, G., AND E. PERATONER. **Sul 1-3-2′ triossi-flavonolo. Ricerche per la sintesi della Datiscetina.** [**On 1-3-2′ trioxy-flavonol. Researches on the synthesis of Datiscetin.**] Gaz. Chim. Italiana 49: 64–69. 1919.—See Bot. Absts. 5, Entry 2160.

2127. CAUDA, A. **Contenuto in essenza dei semi di senape.** [**Essence content of mustard seeds.**] Staz. Sperim. Agrarie Italiane 52: 122. 1919.—A short note on the total content of essence in seeds of different species and of the same species cultivated in different regions. *Brassica alba, B. nigra* and *B. carinata* were studied and the determination made by bromine oxydation in a paraffin bath and subsequent weighing as sulphate. *B. nigra* seeds were found to contain a higher percentage of essence than *B. alba* and *B. carinata* while seeds from plants grown in northern localities contained greater percentages than the seeds from plants grown in southern regions. Size of seed seems also to have an influence, the smaller having a higher percentage than the larger.—*A. Bonazzi.*

2128. COHN, EDWIN J., JOSEPH GROSS, AND OMER C. JOHNSON. **The isolectric points of the proteins in certain vegetable juices.** Jour. Gen. Physiol. 2: 145–160. *5 tables, 3 fig.* 1919.

2129. CUSMANO, G. **Sui principi ipotensivi del Viscum album.** [**Hypotensive compounds of Viscum album.**] Gaz. Chim. Italiana 49: 225–228. 1919.—The author prepares a solution of the substances found in *Viscum* by dialyzing a decoction of fresh leaves with water. The hypotensive components pass through the membrane, and their solution thus obtained is concentrated on a water bath and extracted with alcohol (96 per cent). At first there is the formation of a homogeneous mixture, but on standing two strata are separated and the lower one is discarded. The supernatant liquid is again concentrated and again extracted with alcohol. As a guide for the separation of the hypotensive compounds the author used the method of injection in the blood stream of the dog.—*A. Bonazzi.*

2130. DODD, SYDNEY. **St. John's wort and its effects on live stock.** Agric. Gaz. New South Wales 21: 265–272. 1920.—Deals with the effect of a plant, probably *Hypericum perforatum*, upon the different classes of live stock. Sensitized areas appear upon the body, especially where pigment is deficient. Develops mainly under conditions of insolation. Feeding experiments are described.—*L. R. Waldron.*

2131. MCATEE, W. L. **Notes on the flora of Church's Island, North Carolina.** Jour. Elisha Mitchell Sci. Soc. 35: 61–75. 1919.—See also Bot. Absts. 5, Entry 2419.

2132. MOFFAT, C. B. **Some notes on Oenanthe crocata: its character as a poisonous plant.** Irish Nat. 29: 13–18. Feb., 1920.—The "Water hemlock-Dropwort" is notoriously deadly. Many fatal cases are known from eating the plant. DR. CHRISTISON, however, made the discovery that in the vicinity of Edinburgh this species is, for some unknown reason, devoid of toxic properties. In County Wexford the author observed three herds of cows feeding on the plant by preference with no injurious effects. Cases are on record of cattle in other parts of Ireland killed by this poison. Some suggestions are made but no explanation offered.—*W. E. Praeger.*

2133. SALEEBY, N. M. **The treatment of human beriberi with autolyted yeast extract.** Philippine Jour. Sci. 14: 11–14. 1919.—The extract was prepared by the Bureau of Science, from brewers yeast obtained in Manila, by incubating at 35°C. for 48 hours, then filtering and concentrating to one third the volume in partial vacuum below 60°C. About forty acute cases were treated. The dose for adults was 15–40 cc. and children 2–4 cc. Marked results were noted in less than three days and full relief in a week. This extract seemed to behave much the same as hydrolyzed extract of rice polishings, only weaker.—*Albert R. Sweetser.*

2134. SCHÜLER, D. B. **Vergiftungen durch Herbstzeitlose und deren Bekämpfung. [Poisoning by meadow saffron (Colchicum autumnale) and its control.]** Illustrierte Landw. Zeitg. 39: 457. *Fig. 361–363.* 1919.

2135. WELLS, A. H. **The physiological active constituents of certain Philippine medicinal plants. III.** Philippine Jour. Sci. 14: 1–7. *1 pl.* 1919.—As a result of chemical analyses, made in the chemical laboratory of the Bureau of Science, Manila, *Arcangelica flava* (Linn.) Merr. gave 4.8 per cent berberine; *Cassia siamea* Lam., an undetermined alkaloid; and the rhizome of *Geodorum nutans* Ames., 14 per cent of a water soluble adhesive; and *Coriaria intermedia* Mats., a poisonous glucoside, in its leaves and fruit. A bibliography is appended.—*Albert R. Sweetser.*

PHYSIOLOGY

B. M. DUGGAR, *Editor*

CARROLL W. DODGE, *Assistant Editor*

GENERAL

2136. BANCROFT, WILDER D. [Rev. of: HALDANE, J. S. **The new physiology.** *22 x 14 cm., viii+166 p.* J. B. Lippincott Company: Philadelphia, 1919.] Jour. Phys. Chem. 23: 586–587. 1919.

DIFFUSION, PERMEABILITY

2137. BUSCALIONI, L. **Nuove osservazione sulle cellule artificiali. [Further observations on artificial cells.]** Malpighia 28: 403–434. *Pl. 11–12.* 1919.—See Bot. Abstr. 5, Entry 1267.

2138. COUPIN, H. **Sur le lieu d'absorption de l'eau par la racine. [Absorption of water by roots.]** Compt. Rend. Acad. Sci. Paris 168: 1005–1008. 1919.—The roots of pea, bean, sunflower, pumpkin, pine, corn, and rice grew more rapidly and produced more laterals when merely the tip was suspended in water than when the whole root was immersed. Growth was extremely slow when corn roots were moistened in the region of the root hairs only. The author concludes that roots absorb water exclusively by the tip and not by the root hairs; the latter protect the root against too rapid drying out and attach the root firmly to soil particles.—*F. B. Wann.*

2139. CURTIS, OTIS F. **The upward translocation of foods in woody plants. I. Tissues concerned in translocation.** Amer. Jour. Bot. 7: 101–124. *4 fig.* 1920.—Attention is called by the author to the general belief that in woody plants food stored in the lower part of the trunk

and in the roots passes upward in the spring through the xylem. He brings forward evidence, derived from ringed stems, that this is not the case but that the food travels upward chiefly in the phloem.—If a ring of tissues extending to the cambium is removed at the base of a growing twig, growth above the ring is reduced even if the leaves remain, and practically ceases if the leaves are removed. This check to growth is probably due primarily to a lack of food necessary for energy or for building material. If the leaves are left above the ring, enough food is ordinarily manufactured by them to allow of considerable growth. The author suggests that in some cases, especially where tissues above the ring tend to wilt, the check caused by ringing may be due to an inability of the stem to carry up above the ring such osmotically active substances as carbohydrates, and to a consequent inability to draw up water osmotically. He finds that the osmotic concentration of the sap of a twig above a ring is reduced, and is very markedly so if the twig is also defoliated. He suggests the importance of the distribution of osmotically active substances as a factor in causing polarity.—Ringing of the stem below a fruit was found to check the growth of the fruit.—Ringing of dormant twigs was found to decrease greatly the growth of shoots coming from buds above the ring. Such growth as took place was evidently at the expense of starch stored above the ring and proportional to its amount, for at the cessation of growth this starch had quite disappeared. In several species two rings, separated by from 15 to 107 cm., were cut out from dormant twigs in early April, and the twigs examined for starch and sugar about a month later. In all cases starch was found to be practically absent above the upper ring, very abundant between the rings, and considerably less abundant below the lower ring and throughout a similar twig which was unringed. Tests for sugar above, between, and below the rings gave essentially similar results, sugar being much more abundant between the rings than elsewhere.—From these facts the author concludes that although large amounts of carbohydrates are stored in the xylem, there is no appreciable longitudinal transfer of sugars through this tissue, but that to be translocated the stored food must pass radially into the phloem, where it may readily be carried upward or downward. The author also suggests that at least some of the mineral nutrients from the soil may move primarily through the phloem.—*E. C. Sinnott.*

2140. Kopler, Johanna. **Der Dipmorhismus der Spaltöffnungen bei Pandanus.** [Dimorphism of the stomata in Pandanus.] Oesterreich. Bot. Zeitschr. 67: 186–196. *3 fig.* 1918.

2141. LeFevre, Edwin. **Brine tolerance in certain rot organisms.** [Abstract.] Abstr. Bact. 3: 3–4. 1919.—Softening of cucumbers in brine is caused by a wide range of bacteria, among them being organisms causing soft rots, those destroying cellulose, and spore-bearing aerobes. *Bacillus vulgatus* is probably the cause of much of the spoilage, since it has the highest sodium chlorid tolerance and fourth highest acid tolerance of 50 organisms tested. The concentration of salt for preserving cucumbers is between 7 and 8 per cent. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2142. Loeb, Jacques. **Influence of the concentration of electrolytes on the electrification and the rate of diffusion of water through collodion membranes.** Jour. Gen. Physiol. 2: 173–200. *16 fig.* 1919.—Solutions of electrolytes when separated from pure water by a collodion membrane affect the diffusion through the membrane in a way different from that of non-electrolytes. The latter influence the initial rate of diffusion of water approximately in direct proportion to their concentration, which the writer calls the gas effect, as it follows the laws of gas pressure. This effect of the diffusion of water under the conditions of the experiments was noticeable at concentrations above M/64 or M/32. Solutions of electrolytes may also show this gas pressure effect upon the initial rate of water diffusion, but it commences only at higher concentrations, usually at M/16 or higher. With weaker solutions of electrolytes, the gas effect is not evident, but the rate and direction of diffusion of water is determined more by the electrical charge of water, by the nature of the ions and the charges borne by them. Two rules for the sign of the charge of the water were previously given (Bot. Abst., vol. 3, Entry 1203). With an increase in concentrations of electrolytes up to about M/256 or above,

the rate of diffusion of water towards the solution is rapidly increased, which is apparently due to increased attraction for the water by the ions bearing a charge opposite to that borne by water. With a further increase in concentration from M 256 to about M/16, depending somewhat upon the nature of the electrolyte, the rate of the diffusion of water towards the solution is less than that at weaker concentrations, which is apparently due to a more rapid increase in the repelling action of that ion bearing the same charge as the water particles. In fact, this repelling action may become so dominant as to develop negative osmosis when diffusion takes place from the solution toward the pure water decreasing the volume of the solution. Therefore, within the range above stated, the reverse of what would be expected from van't Hoff's law is observed; that is, with an increase in concentration of the electrolyte, the attraction for water diminishes. This was demonstrated with a number of solutions, in some cases when water behaved as if positively charged and repelled by the cations, and in others when it behaved as if negatively charged and repelled by anions, especially those with higher valences. When experimenting to determine the effects of solutions on the diffusion of negatively charged water, it was necessary to use membrance previously treated with gelatin.—*Otis F. Curtis.*

2143. MACDOUGAL, D. T., AND H. A. SPOEHR. **The solution and fixation accompanying swelling and drying of biocolloids and plant tissues.** Plant World 22: 129-137. 1919.—Desiccated slices of *Opuntia discata* showed vigorous swelling in water, dilute acids, alkalies, and salt solutions; but on being dried after the first swelling, they exhibited a greatly reduced power of swelling. Substances giving the sections their high imbibition capacity are believed to be extracted during the first swelling. The loss during the first swelling was about 7 per cent of the total solids, and mainly amino-acids, hexoses, malates, and salts. Biocolloids like agar and gelatine-agar show similar losses during swelling, about 15 per cent being extracted. Reduced swelling after extraction and drying may also be related to changes in the colloidal mesh, aggregations, or coagulations which cannot be reversed by simple hydration.—*Charles A. Shull.*

2144. PATERNO, E. **Origini e sviluppo della crioscopa.** [Origin and development of cryoscopy.] Gaz. Chim. Italiana 49: 381-411. 1919.—A historical study and digest of the literature on the subject of cryoscopic methods, and measurements, chiefly considered from the standpoint of pure chemistry.—*A. Bonazzi.*

WATER RELATIONS

2145. HARDING, S. T. **Relation of the moisture equivalent of soils to the moisture properties under field conditions of irrigation.** Soil Sci. 8: 303-312. *6 fig.* 1919.—See Bot. Abstr. 5, Entry 2320.

2146. HILL, LEONARD, AND HARGOOD-ASH, D. **On the cooling and evaporative powers of the atmosphere, as determined by the Kata-thermometer.** Proc. Roy. Soc. London 90B: 438-447. 1919.—Data are presented endorsing the efficiency and applicability of the Kata-thermometer as an instrument for determining the cooling and evaporative powers of the atmosphere.—*R. W. Webb.*

2147. MIDDLETON, HOWARD E. **The moisture equivalent in relation to the mechanical analysis of soils.** Soil Sci. 9: 159-167. *1 fig.* 1920.—See Bot. Abstr. 5, Entry 2331.

2148. SAYRE, J. D. **The relation of hairy leaf coverings to the resistance of leaves to transpiration.** Ohio Jour. Sci. 20: 55-75. *7 fig.* 1920.—Mullein (*Verbascum thapsus*) leaves offer greater resistance to water loss in darkness than in light and less in wind than in still air, when compared to tobacco (*Nicotiana sp.*) leaves, and they respond as much or more to environmental changes. Removal of hairs does not alter resistance of mullein leaves in still air and light; but slightly decreases resistance in wind and light, and greatly decreases resistance in still air and darkness, because the cuticular surface is more exposed. In darkness

stomata are closed and water loss is cuticular. Removal of hairs increases cuticular water loss only. As water loss from surface of mesophyll cells is 20 to 40 times cuticular water loss, leaf hairs may be disregarded as protection against ordinary wind and light.—*H. D. Hooker, Jr.*

MINERAL NUTRIENTS

2149. Ames, J. W., and C. J. Schollenberger. **Calcium and magnesium content of virgin and cultivated soils.** Soil Sci. 8: 323–335. 1919.—See Bot. Absts. 5, Entry 2293.

2150. De Turk, Ernest. **Potassium-bearing minerals as a source of potassium for plant growth.** Soil Sci. 8: 269–301. 1919.—See Bot. Absts. 5, Entry 2290.

2151. Howard, L. P. **The relation of certain acidic to basic constituents of the soil affected by ammonium sulfate and nitrate of soda.** Soil Sci. 8: 313–321. 1919.—See Bot. Absts. 5, Entry 2261.

2152. Lamprov, E. **Les engrais radioactifs.** [Radioactive fertilizers.] Rev. Hortic. [Paris] 91: 393–394. 1919.—See Bot. Absts. 6, Entry 123.

2153. Rudolfs, W. **Influence of sodium chloride upon the physiological changes of living trees.** Soil Sci. 8: 397–425. 7 *pl.* 1919.—The application of 1 to 10 pounds of sodium chloride to oak, birch, and maple trees shows a favorable effect in the smaller amounts and a toxic action in the larger. Maple is most easily affected, followed by birch and oaks. The higher trees are more resistant than the lower ones of the same species.—*W. J. Robbins.*

2154. Shive, John W. **The influence of sand upon the concentration and reaction of a nutrient solution for plants.** Soil Sci. 9: 169–179. 1920.—A nutrient solution, consisting of potassium dihydrogen phosphate, calcium nitrate, and magnesium sulphate was added to washed or unwashed sea sand and after longer or shorter intervals of contact, the solution was drawn off and the freezing point and hydrogen-ion concentration determined. With washed sand no adsorptive effect was noted. The unwashed sand during the first 24 hour period reduced the freezing point of the solution 8.5 per cent but did not affect the reaction. By renewing the solution, the adsorptive effect of the washed sand was eliminated.—*W. J. Robbins.*

2155. Winterstein, E. **Über das Vorkommen von Jod in Pflanzen.** [The occurrence of iodine in plants.] Zeitschr. Physiol. Chem., 104: 54–58. 1919.

PHOTOSYNTHESIS

2156. Anonymous. **Starch formation in leaves, and photographic prints.** Sci. Amer. Monthly 1: 416. 1920.

METABOLISM (GENERAL)

2157. Allen, Paul W. **"Rope" producing organisms in the manufacture of bread.** [Abstract.] Absts. Bact. 3: 4. 1919.—*Bacillus subtilis* and 14 other very similar spore-bearing organisms produced "rope" in bread during the first 30 hours when bread was stored at 25°. *Bacillus bulgaricus, B. aerogenes viscosus,* and *Bact. lactis viscosus* failed to produce "rope" under similar conditions.—In a commercial bread oven the internal temperature of a loaf did not reach 100° although the oven was held uniformly at 204°. [From author's abstract of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2158. Allen, Paul W. **The manufacture of starch and other corn products as affected by "rope" producing organisms.** [Abstract.] Absts. Bact. 3: 4. 1919.—"In a wet process of the manufacture of products from corn, 'rope' production often develops during hot weather, causing serious difficulties in the operation of the reels and cutting down the yield of starch per bushel of corn.—*B. bulgaricus* was repeatedly isolated from viscous starch and gluten

liquors. This organism was also isolated from the corn as it arrived in the cars. Normal starch and gluten liquors became exceedingly viscous when inoculated with it and held at 37°C. for twenty-four hours."—[Author's abst. of paper read at scientific session, Soc. Amer. Bact.]

2159. BARGELLINI, G. **Sul 1-2-3-triossiflavone. Contributo alla conoscenza della costituzione della Scutellareina. [On 1-2-3-trioxy-flavone. Contribution to the knowledge of the constitution of scutellarein.]** Gaz. Chim. Italiana 49: 47–63. 1919.

2160. BARGELLINI, G., AND E. PERATONER. **Sul 1-3-2. triossi-flavonolo. Ricerche per la sintesi della Datiscetina. [On 1-3-2. trioxy-flavonol. Researches on the synthesis of Datiscetin.]** Gaz. Chim. Italiana 49: 64–69. 1919.—A theoretical study of the chemical constitution of the derivatives of the glucoside of *Datisca cannabina* and of the synthetic preparation of the following compounds: 2'oxy-4'-6'-2-trimethoxy-calcone, 1-3-2' tri-methoxy-flavonone, 1-3-2' trimethoxy-isonitrous-flavonone and of 1-3-2" trimethoxy-flavonol.—*A. Bonazzi.*

2161. BUNKER, JOHN W. M. **Some factors influencing diphtheria toxin production.** [Abstract.] Abstr. Bact. 3: 8–9. 1919.—"Toxin production depends upon growth, but growth alone does not assure toxin. By controlling conditions which affect growth, toxin production can in turn be influenced." The initial hydrogen-ion concentration of the medium (optimum P_H 7 to 7.5), the final hydrogen-ion concentration (range bounded by P_H 7.8 to 8.25), and the presence of suitable polypetids in the medium are among the controllable factors which influence toxin production by *Bacterium diphtheriae*. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2162. COHN, EDWIN J., JOSEPH GROSS, AND OMER C. JOHNSON. **The isoelectric points of the proteins in certain vegetable juices.** Jour. Gen. Physiol. 2: 145–160. 3 *fig.* 1919.

2163. DE BESTEIRO, D. C., AND M. MICHEL-DURAND. **Influence de la lumière sur l'absorption des matières organique du sol par les plantes. [The influence of light on the absorption by plants of the organic materials of the soil.]** Compt. Rend. Acad. Sci. Paris 168: 467–470. 1919.—The pea, a heliophile plant which cannot adapt its assimilation of CO_2 by the green leaves to a condition of feeble light, is likewise incapable of increasing the absorptive power of the roots whereby it might draw upon the soil for a larger quantity of organic carbon. There is for this plant no parallelism or compensation between the absorption of CO_2 by the leaves and the absorption of organic carbon by the roots.—*G. M. Armstrong.*

2164. DONK, P. J. **Some organisms causing spoilage in canned foods, with special reference to flat sours.** [Abstract.] Abstr. Bact. 3: 4. 1919.—"A thermophilic organism was isolated from cans of 'flat sour' corn. This is a large aerobic, facultative anaerobic bacterium, Gram negative, spore-bearing and non-motile, with minimum, optimum and maximum temperatures of 45°, 60° and 76°C. respectively. It grows well on all ordinary culture media and does not produce gas when grown in any of the standard sugar-broths. Pure culture introduced into sterile cans of a variety of canned foods (corn, peas, string beans, pumpkins, and tomatoes) produced the same characteristic 'flat sour.'"—Twenty other organisms were identified from various sources. Critical conditions are being determined especially with reference to temperature and acidity, for both vegetative and spore forms. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2165. DRUMMOND, JACK CECIL. **Researches on the fat-soluble accessory substance. I. Observations upon its nature and properties.** Biochem. Jour. 13: 81–94. 1919.—Temperature, rather than oxidation or hydrolysis, appears to be the chief agent in the inactivation of fat-soluble A of natural animal fats. Destruction occurs at temperatures ranging from 100° to 37°, the severity varying with the temperature. Destruction at relatively low temperatures suggests that the fat-soluble A may be an ill-defined and labile substance. The substance may be extracted with alcohol, but not with acid or water, and it has not been identified with any of the recognized components of fat.—*R. W. Webb.*

2166. Drummond, Jack Cecil. **Researches on the fat-soluble accessory substance. II. Observations on its rôle in nutrition and influence on fat metabolism.** Biochem. Jour. 13¹: 95–102. 1919.—The presence of fat soluble A in the diet of adult rats is essential to their health, while the absence of this substance increases their susceptibility to bacterial diseases. A deficiency of fat-soluble A causes no characteristic pathological lesion in adult rats; does not directly influence the absorption of fats, and appears to play no important part in the absorption of fatty acids nor in their synthesis into fats.—*R. W. Webb.*

2167. Durbin, H. E., and M. J. Lewi. **The preparation of a stable vitamine product and its value in nutrition.** Amer. Jour. Med. Sci. 159: 264–286. 1920.—Following a review of the literature on the relation of vitamines to growth in animals the authors describe a method of preparing a stable vitamine from corn, autolyzed yeast, and orange juice, the final product being a grayish, non-hygroscopic powder which retains its effectiveness for 5 months or longer. Experiments showing the efficiency of this vitamine in treating malnutrition in children, pigeons, and guinea pigs are described.—*Harris M. Benedict.*

2168. Eddy, Walter H. **The vitamine.** Abstr. Bact. 3: 313–330. 1919.—This is a bibliographic review dealing with the following: historical, methods of preparation, sources, structure, function, and organisms requiring vitamines for development. The bibliography contains 236 titles.—*D. Reddick.*

2169. Gillespie, L. J. **Colorimetric determination of hydrogen-ion concentration without buffer mixtures, with especial reference to soils.** Soil Sci. 9: 115–136. *1 fig.* 1920.—See Bot. Abstr. 5, Entry 1324.

2170. Grace, L. G., and F. Highberger. **Variations in the hydrogen ion concentration in uninoculated culture medium.** Jour. Infect. Diseases 26: 457–462. 1920.—A medium consisting of Liebig's Beef Extract 0.3 per cent, Difco Peptone 1 per cent, NaCl 0.5 per cent, glucose 1 per cent, and adjusted to a reaction of P_H 6.4, 6.8, 7.2, 7.6, and 8.0, was found to change in reaction not only on autoclaving, but also on allowing the control medium to incubate. Plain broth, free from glucose, did not give as great variations in reaction as the glucose broth. It is suggested that the acid is formed in the medium by the breaking up of the glucose and perhaps also by the formation of amino acids from the peptone.—*Selman A. Waksman.*

2171. Häggland, Erik. **Beiträge zur Kenntnis des Lignins.** [Lignin.] Arkiv. Kemi, Min., Geol. 7¹: 1–20. 1918–19.

2172. Hammer, B. W., and D. E. Bailey. **The volatile acid production of starters and of organisms isolated from them.** Iowa Agric. Exp. Sta. Res. Bull. 55: 223–246. 1919.—A study of a number of "starters" of good quality showed that more than one organism was present. Experimental data showed that the high volatile acid content of starters is not altogether due to the action of *Bacterium lactis acidi.*—*Florence Willey.*

2173. Harrington, Geo. T. **Comparative chemical analyses of Johnson grass seeds and Sudan grass seeds.** Proc. Assoc. Official Seed Analysts of North America 1919: 58–64. 1919. —See Bot. Abstr. 5, Entry 1148.

2174. Hess, Alfred F., and Lesser J. Unger. **The effect of heat, age, and reaction on the antiscorbutic potency of vegetables.** Proc. Soc. Exp. Biol. and Med. 16: 52–53. 1919.—Results obtained from experiments with guinea pigs show that the antiscorbutic value of vegetables decreases with increase in age of the vegetables and also with their subjection to high temperature. Their efficacy remains the same for both acid and alkaline reactions. However, the effect of alkalinization or of heat is greatly influenced by the time-factor.—*R. W. Webb.*

2175. Lucius, Franz. **Über die Trennung von Glykose und Fructose.** [Separation of glucose and fructose.] Zeitschr. Untersuch. Nahrungs-u. Genussmittel 38: 177–185. 1919.

2176. MELLANBY, JOHN. **The composition of starch. I. Precipitation by colloidal iron. II. Precipitation by iodine and electrolytes.** Biochem. Jour. 13²: 28-36. 1919.—A detailed account is given of the effects produced by colloidal iron and by iodine, in the presence and absence of electrolytes, on a solution of potato starch in water. The results indicate that, while starch grains are composed chiefly of amylogranulose, they contain various polymers ranging in complexity from amylodextrin to amylocellulose; however, the relative quantities of the dextrin and the cellulose compounds are small.—*R. W. Webb.*

2177. MOLLIARD, MARIN. **Influence de certaines conditions sur la consommation comparée du glucose et du lévulose par le Sterigmatocystis nigra a partir du saccharose. [The influence of certain conditions on the comparative consumption of glucose and levulose (derived from inversion of saccharose) by Sterigmatocystis nigra.]** Compt. Rend. Acad. Sci. Paris 167: 1043-1046. 1918.—The ratio of consumption of glucose and levulose in a modified Raulin' solution varies upon the addition of different quantities of HCl and with changes in the nitrogen ratio, the glucose being used more rapidly. The utilization of the two sugars appears to depend on a function of the mycelium and not on the differential diffusion of the sugars. —*G. M. Armstrong.*

2178. NORTHRUP, ZAE. **Agar-liquefying bacteria.** [Abstract.] Absts. Bact. 3: 7. 1919. See Bot. Absts. 5, Entry 1969.

2179. OSBORNE, THOMAS B., AND LAFAYETTE B. MENDEL. **The extraction of "fat-soluble vitamine" from green foods.** Proc. Soc. Exp. Biol. and Med. 16: 98-99. 1919.—Contrary to the statements of several investigators, the writers experimentally demonstrate that it is both possible and practicable to obtain "fat-soluble" vitamine from green foods by means of ether extraction.—*R. W. Webb.*

2180. RIVIÈRE, G. **De la progression de la maturation dans les poires a couteau. [Progression of ripening in table pears.]** Jour. Soc. Nation. Hortic. France 20: 306-307. 1919.—See Bot. Absts. 5, Entry 1770.

2181. SCHOWALTER, E. **Zur Titration von Zuckerarten. [Titration of sugars.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 221-227. 1919.

2182. TASAKI, BUHACHIRÔ, AND USHIO TANAKA. **On the toxic constituents in the bark of Robinia pseudacacia L.** Jour. Coll. Agric. Tokyo Imp. Univ. 3: 337-356. *2 fig.* 1918.—The toxic constituent proved to be a glucoside and has been named "Robitin." It amounts to about 1 per cent of the fresh bark. The symptoms of intoxication in animals are discussed.—*B. M. Duggar.*

2183. WAKSMAN, SELMAN A. **On the metabolism of actinomycetes.** [Abstract.] Absts. Bact. 3: 2-3. 1919.

2184. WAKSMAN, SELMAN A., AND JACOB S. JOFFE. **Studies in the metabolism of actinomycetes. IV. Changes in reaction as a result of the growth of actinomycetes upon culture media.** Jour. Bact. 5: 31-48. 1920.—The hydrogen-ion concentration of various media was tested before and after the growth of various forms of Actinomyces with a view to determine the changes in the media due to the different substances added as sources of carbon and nitrogen. It was found that no appreciable amount of acid was formed from the carbohydrates studied which included glucose, lactose, sucrose, maltose, mannitol, glycerol, starch, inulin, and sodium acetate. When sodium nitrate was added to the medium with the different carbohydrates, an alkaline reaction resulted; if sodium nitrite was added instead of the nitrate an acid was produced. When ammonium salts of strong acids are present as the only source of nitrogen, the medium tends to become distinctly acid; with proteins and amino acids the reaction may be unchanged or may become either acid or alkaline depending on the species, source of carbon, and the hydrogen-ion concentration of the medium.—*Chester A. Darling.*

2185. Zellner, J. **Über die chemische Zusammensetzung der Agave americana L. nebst Bemerkungen über die Chemie der Succulenten im allgemeinen.** [Chemical composition of Agave americana and the chemistry of succulents in general.] Zeitschr. Physiol. Chem. 104: 2–10. 1919.

METABOLISM (NITROGEN RELATIONS)

2186. Bokorny, T. **Notizen über Harnstoff und einige andere N-Quellen der grünen Pflanzen.** [Urea and a few other sources of nitrogen for green plants.] Pflüger's Arch. Physiol. 172: 466–496. 1918.

2187. Conn, H. J., and R. S. Breed. **The use of the nitrate-reduction test in characterizing bacteria.** New York Agric. Exp. Sta. [Geneva] Tech. Bull. 73. *31 p.* 1919.—This is a reprint of an article in: Jour. Bact. 4: 267–290. 1919.—*Abstractor.*

2188. Gibbs, W. M. **The isolation and study of nitrifying bacteria.** Soil Sci. 8: 427–481. *4 pl., 1 fig.* 1919.—Pure cultures of *Nitrosomonas* and *Nitrobacter* isolated from the soil were grown on washed agar or silicic acid gel containing suitable nutrient salts. On plates the colonies were extremely small and required a microscope for their study. Pure cultures of *Nitrosomonas* and *Nitrobacter* did not produce visible growth when inoculated into bouillon. Pure cultures of these organisms were maintained in a liquid medium indefinitely. Sodium chloride at a concentration of 1 per cent was very toxic for *Nitrosomonas*. The soil extract used to prepare nutrient solutions for these organisms did not prove toxic. The thermal death point for *Nitrobacter* was 56–58°C. and for *Nitrosomonas*, 53–55°. At 28°C. *Nitrobacter* in pure culture produced a maximum of 527 mgm. of nitrogen as nitrates per 100 cc. of solution. *Nitrosomonas* at 28°C. in pure culture produced a maximum of 218.9 mgm. of nitrogen as nitrites per 100 cc. of solution.—*W. J. Robbins.*

2189. Mayer, A., and G. Schaeffer. **Extension aux cas des microbes de la notion d'acides aminés indispensables. Rôle de l'arginine et de l'histidine dans la culture du bacille de Koch sur milieux chimiquement définis.** [The indispensable amino acids for microörganisms. The rôle of arginine and of histidine in the culture of Koch's bacillus on synthetic media.] Compt. Rend. Soc. Biol. 82: 113–115. 1919.

2190. Meisenheimer, Jakob. **Die stickstoffhaltigen Bestandteile der Hefe.** [The nitrogen constituents of yeast.] Zeitschr. Physiol. Chem. 104: 229–283. 1919.

2191. Saillard, Émile. **Balance de l'azote pendant la fabrication du sucre. Précipitation des matières albuminoïdes de la betterave par l'acide sulfureux, les bisulfites et les hydrosulfites.** [The balance of nitrogen during the refining of sugar. Precipitation of the albuminoids of the beet by sulphurous acid, bisulphites and hydrosulphites.] Compt. Rend. Acad. Sci. Paris 170: 129–130. 1920.—The determination of the relative amounts of nitrogenous compounds present in the sugary extract of the beet at the various steps in the commercial refining of sugar is given. There is also included the effect of various reagents used in the processes in precipitating these nitrogenous compounds.—*C. H. and W. K. Farr.*

2192. Waksman, Selman A. **Studies in the metabolism of actinomycetes. III. Nitrogen metabolism.** Jour. Bact. 5: 1–30. 1920.—The utilization of different nitrogenous compounds by several different species of Actinomycetes and the transformation of these substances due to the action of the organisms are considered. Various nitrogenous compounds were tested, and glycerol or glucose was used principally as the source of carbon. The conclusions reached are: the Actinomycetes do not utilize atmospheric nitrogen; proteins and amino acids furnish the best sources of nitrogen, amides being utilized to a limited extent; nitrates and nitrites are utilized fairly well; ammonium salts are poor sources of nitrogen if glycerol is used as a source of carbon, but if glucose is used these salts are readily utilized; the production of ammonia from proteins and amino acids is not characteristic of the group, although some may be produced on continued incubation. Pigments are produced by many species when grown in media containing proteins and amino acids. [See also Bot. Absts. 3, Entries 2860, 2883.]—*Chester A. Darling.*

METABOLISM (ENZYMES, FERMENTATION)

2193. ANDRÉ, G. **Sur l'inversion du sucre de canne pendant la conservation des oranges. [The inversion of sucrose in oranges during storage.]** Compt. Rend. Acad. Sci. Paris 170: 126–128. 1920.—Oranges were cut in two, one-half being analyzed at once for the amounts of citric acid, sucrose, and invert sugar present. The other half was deposited in a container in which was also placed a small vessel of toluene, and an analysis was made of this portion after an interval of 4 or 5 months. From 11.65 to 57.33 per cent of the sucrose originally present is changed during this period to invert sugar. The amount of citric acid remains about the same during the interval, although specimens differ in the original amount. The rate of inversion is more rapid at certain times during this period than at others. The rate of inversion of sucrose by citric acid was also determined *in vitro* at the concentrations obtaining in the expressed orange juice. 94.08 per cent of the sucrose is inverted in 78 days. The rate is thus faster *in vitro* than in the orange tissue. The variations in the rate of inversion within the tissue are explicable on the basis of lack of homogeneity. It does not appear that the rate of inversion is affected by the amount of acid present.—*C. H. and W. K. Farr.*

2194. ANONYMOUS. **Fresh information concerning yeast.** Sci. Amer. Monthly 1: 417–420. 1920.—Certain investigations on yeast in progress at the Berlin Institute of Fermentation and at the Mellon Institute at Pittsburgh are described.—*Chas. H. Otis.*

2195. EULER, H. v., AND E. MOBERG. **Invertase und Gärungsenzyme in einer Oberhefe. [Invertase and ferment enzymes in surface yeast.]** Arkiv Kemi, Min., Geol. 7ᴮ: 1–17. 1918–19.

2196. EULER, HANS v., AND OLOF SVANBERG. **Enzymchemische Studien. [Enzyme chemistry.]** Arkiv Kemi, Min., Geol. 7ᴮ: 1918–19.

2197. GIAJA, J. **La levure vivante provoque-t-elle la fermentation du sucre uniquement par sa zymase? [Does the living yeast cell induce fermentation merely by zymase?]** Compt. Rend. Soc. Biol. 82: 804–806. 1919.

2198. GRIGAUT, A., F. GUÉRIN, AND MME. POMMAY-MICHAUX. **Sur le mesure de la protéolyse microbienne. [Estimation of microbic proteolysis.]** Compt. Rend. Soc. Biol. 82: 66–70. 1919.

2199. HAMMER, B. W. **Studies on formation of gas in sweetened condensed milk.** Iowa Agric. Exp. Sta. Res. Bull. 54: 211–220. *2 fig.* 1919.—Gas formation in sweetened condensed milk was found to be due to a budding organism *Torula lactis-condensi*. There was a variation in different brands of condensed milk in their susceptibility to fermentation with the yeast studied. The milk solids may retard the growth, since the yeast may grow in a saturated sucrose solution.—*Florence Willey.*

2200. HARVEY, R. B. **Apparatus for measurement of oxidase and catalase activity.** Jour. Gen. Physiol. 2: 253–254. 1920.

2201. HÉRISSEY, H. **Sur la conservation du ferment oxydant des champignons. [Preservation of the oxidizing ferment of fungi.]** Compt. Rend. Soc. Biol. 82: 798–800. 1919.

2202. KOPELOFF, NICHOLAS, S. BYALL, AND LILLIAN KOPELOFF. **The effect of concentration on the deteriorative activity of mold spores in sugar.** Louisiana Planter and Sugar Manufacturer 64: 270–271. 1920.—Spores of *Aspergillus sydowi*, *Aspergillus niger*, and *Penicillium expansum* are responsible for some of the deterioration of sugar and sugar products. This deterioration increases with a decreased concentration of the molasses or of the films around the sugar crystals.—*C. W. Edgerton.*

2203. KOPELOFF, NICHOLAS, AND LILLIAN KOPELOFF. **The deterioration of manufactured sugar by molds.** Louisiana Planter and Sugar Manufacturer 63: 202–206. 1919.—The

data given in this article have been abstracted from another source (KOPELOFF, NICHOLAS, AND LILLIAN KOPELOFF. **The deterioration of cane sugar by fungi.** Louisiana Agric. Exp. Sta. Bull. 166. *72 p. Pl. 1-2, fig. 1.* 1919.)—*C. W. Edgerton.*

2204. LEMOIGNE. **Fermentation butylèneglycolique du saccharose par les bactéries du groupe du Bacillus prodigiosus.** [**Butylèneglycolic fermentation of saccharose by bacteria of the group Bacillus prodigiosus.**] Compt. Rend. Soc. Biol. 82: 234-236. 1919.

2205. LEMOIGNE. **Réaction spécifique du 2-3-butylèneglycol et de l'acétylméthylcarbinol, produits de la fermentation butylèneglycolique.** [**The specific reaction of 2-3-butyleneglycol and of acetylmethylcarbinol as products of butyleneglycolic fermentation.**] Compt. Rend. Acad. Sci. Paris 170: 131-132. 1920.—The group of bacteria including *Bacillus lactis aerogenes* and *B. coli* which accomplish the fermentation of butyleneglycol is found capable of very accurate detection by oxidizing the products of this fermentation with ferric chlorid and the treatment of the compound thus formed with a nickel salt. The reaction is highly sensitive and specific.—*C. H. and W. K. Farr.*

2206. MCGUIRE, GRACE, AND K. GEORGE FALK. **Studies on enzyme action. XVIII. The saccharogenic actions of potato juice.** Jour. Gen. Physiol. 2: 215-227. 1920.—A study was made to determine the effect of saccharogenic enzymes of potato juice on carbohydrates added as well as those contained in the juice. Amylase was present and was most active both upon the starch of the juice and upon added starch at a hydrogen ion concentration of P_H 6 to 7, which corresponded to that of the normal juice. Sucrase was present and was most active upon the sucrose (or raffinose) present in the juice, as well as upon added sucrose at a hydrogen ion concentration of P_H 4 to 5. No maltase was detected.—*Otis F. Curtis.*

2207. OELSNER, ALICE, AND A. KOCH. **Über den abweichenden Verlauf der Alkoholgärung in alkalischen Medien.** [**Irregular course of alcoholic fermentation in alkaline media.**] Zeitschr. Physiol. Chem. 104: 175-181. 1919.

2208. PRINSEN GEERLIGS, H. C. **Manufacture of glycerin from molasses.** Louisiana Planter and Sugar Manufacturer 63: 268-269. 1919. [Translated from: De Suikerindustrie 19: 195-202, by F. W. Zerban.]—An account of the fermentation process involved in the manufacture of glycerin.—*C. W. Edgerton.*

2209. WENT, F. A. F. C. **On the course of the formation of diastase by Aspergillus niger.** Proc. K. Akad. van Wetenschappen te Amsterdam 21: 479-493. *3 fig.* 1919.—The fungus was grown on a liquid medium using glucose and NH_4NO_3 as sources of C and N. The fungus mats were ground with kieselguhr and extracted with the culture fluid. The quantity of diastase was determined by following the time interval required for the disappearance of starch from a starch solution of known strength, using a dilute iodine solution as indicator. Destruction of the enzyme in the mycelium takes place from the beginning, but this is negligible at first in comparison with the production of the enzyme, A maximum of production is reached in about 5 days from the commencement of germination, after which the total quantity declines rapidly. The nutrient fluid never shows more than a small part of the total enzyme, and this perhaps from dead cells.—*C. R. Hursh.*

METABOLISM (RESPIRATION)

2210. ANONYMOUS. **How age affects the respiration of leaf cells.** Sci. Amer. Monthly 1: 310. 1920.—A brief report of several investigations of respiratory phenomena, and especially those of M. Nicholas in: Revue Générale de Botanique 30, No. 335, 1918.—*Chas. H. Otis.*

2211. LINHART, GEORGE A. **The free energy of biological processes. Preliminary paper.** Jour. Gen. Physiol. 2: 247-251. 1920.—This is a brief statement of a problem which is being started to determine by thermodynamic calculations the efficiency in the use of energy from the carbohydrate of a culture solution during the process of nitrogen fixation by *Azotobacter.* —*Otis F. Curtis.*

2212. NICOLAS, G. **Contribution à l'étude des relations qui existent dans les feuilles, entre la respiration et la présence de l'anthocyane. [Relations which exist in the leaves between respiration and the presence of anthocyanin.]** Rev. Gén. Bot. 31: 161–178. 1919.—Comparative studies of the respiration of red and green leaves of the same species were made. It was found that leaves which become red as a result of some external influence (for example, light intensity, low temperature, or attacks of parasites) and those leaves which are red when young, becoming green later in their development, show an intensity of respiration greater than the green leaves of the same species. This is especially true with regard to the amount of oxygen absorbed. The leaves which are normally red, that is, turn red in old age, have a much lower respiratory intensity than the green leaves of the same species. The influence of old age furnishes sufficient explanation for this lower value. The respiratory quotient (CO_2/O_2) is, with one exception, always lower in the cases of the red leaves. These results indicate a greater fixation of oxygen in the red leaves than in the green leaves. Analyses for acidity showed in every case a greater acidity in the red leaves. The author states that in the leaves accidentally reddened there is a greater accumulation of soluble carbohydrates. He thinks that the greater acidity of the red leaves is due to the presence of these compounds, resulting in a greater fixation of oxygen and a consequent lowering of the respiratory quotient. —*R. S. Nanz.*

2213. PEIRCE, G. J. **Testing seeds with a thermometer.** Sci. Amer. Monthly 1: 259 1920.—The vitality, germinating and growing power, cleanness and soundness of seeds can be determined, according to the kind of seed, by their temperature behavior when placed in sterile water in Dewar flasks or thermos bottles for 2 days.—*Chas. H. Otis.*

ORGANISM AS A WHOLE

2214. BOYER, G. **Études sur la biologie et la culture des champignons supérieurs. [Biology and culture of higher fungi.]** Mem. Soc. Sci. Phys. Nat. Bordeaux VII. 2: 233–344. *IV pl., 90 fig.* 1918.—See Bot. Absts. 5, Entry 1931.

2215. BRENCHLY, WINIFRED E. **Some factors in plant competition.** Ann. Appl. Biol. 6: 142–170. *Pl. 5, 10 fig.* 1919.

2216. C. A. H. [Rev. of: LUMIÈRE, AUGUSTE. **Le mythe des symbiotes.** (The myth of symbiosis.) *xi+205 p.* 8°. Masson: Paris, 1919.] Jour. Botany 58: 26. 1920.

2217. JIVANNA RAO, P. S. **The formation of leaf-bladders in Eichornia speciosa, Kunth (Water hyacinth).** Jour. Indian Bot. 1: 219–225. *5 fig.* 1920.—See Bot. Absts. 5, Entry 1803.

2218. MANARESI, A. **Sulla biologia florale del pesco. 2 nota. [Floral biology of the peach. 2nd note.]** Staz. Sperim. Agrarie Italiane 52: 42–67. 1919.—See Bot. Absts. 5, Entry 1757.

2219. SHREVE, FORREST. **Physiology of the mangrove.** [Rev. of: BOWMAN, H. H. M. **Ecology and physiology of the red mangrove.** Proc. Amer. Phil. Soc. 56: 589–672. *Pl. 4–9.* 1917.] Plant World 22: 146–147. 1919.

GROWTH, DEVELOPMENT, REPRODUCTION

2220. CALKINS, GARY N. **The effect of conjugation.** Proc. Soc. Exp. Biol. and Med. 16: 57–60. 1919.—From a study of *Uroleptus mobilis*, the writer presents data showing that the absence of conjugation promotes a noticeable physiological weakness ultimately ending in natural death, while the presence of conjugation promotes a rejuvenescence of the protoplasm. —*R. W. Webb.*

2221. CHAMBERS, MARY H. **The effect of some food hormones and glandular products on the rate of growth of Paramecium caudatum.** Biol. Bull. [Woods Hole] 36: 82–91. 1919.—As a food hormone potato extract has little effect on the division rate. The influence of yeast

is evident in the resulting increase of the division rate. Contrasting results were obtained with pituitary solution added to the basis fluid. Suprarenal extract caused an increase in the rate of division.—*C. R. Hursh.*

2222. Linossier, G. **Sur le développment de l'Oïdium lactis en milieux artificiels. Influence de la quantité de semence sur le poids de la récolte. [The development of Oïdium lactis in artificial media. Influence of the quantity of inoculum on the weight of the fungous product resulting.]** Compt. Rend. Soc. Biol. 82: 240-242. 1919.

2223. MacDougal, D. T. **Hydration and growth.** Carnegie Inst. Wash. Publ. 297. *17 x 25 cm. V+176 p., 52 fig.* 1920.—The author prepared biocolloids by mixing proteins, usually of plant origin, such as bean or oat protein, with agar, gum arabic, prosopis gum, tragacanth, or opuntia mucilage. The colloidal suspension of these mixtures in water was partially dried in thin plates and the hydration (that is, the amount of water taken up when sections of these plates were immersed in solutions) was measured by means of an auxograph developed especially for this purpose. Solutions of acids, alkalis, and salts were employed and a rather close parallelism was shown between the swelling of these biocolloids and cell masses, such as sections of joints of opuntia, cotyledons of beans, and leaves of various plants. In this connection the point is brought out that vegetative cell masses, such as are responsible for growth, are composed of colloids predominantly of a carbohydrate character, frequently of pentosan nature. These pentosans do not dissociate and their swelling capacity is less in electrolytes than in pure water. The hydration of carbohydrates is retarded by hydrogen ions.—Biocolloids behave in much the same way as do cell masses, in nutrient solutions and in bog and swamp waters. Under fluctuating or alternating hydration effects, the basis of xerophily and succulence, the writer details experiments in which biocolloids were subjected to alternate treatments of acids and alkalis in solution. As a result of this treatment, an alternate swelling and shrinking of the biocolloid was brought about. He considers these phenomena as related to the structural variation of leaves of *Castilleia latifolia;* these leaves being thin and highly acid when growing under mesophytic conditions while succulent and less acid leaves in arid locations. Temperature effects and water deficit, or unsatisfied hydration capacity, both in biocolloids and cell masses, are discussed.—Growth of tissues consists of two fundamental features, hydration of the colloidal material of the plasma and the arrangement of additional colloidal material in colloidal structures with entailed additional capacity for absorbing water. The character of the hydration depends upon the character of the cell colloids, proteinaceous colloids showing increases of hydration capacity with acidity, while when the colloidal material is more largely carbohydrate—such as pentosans—the reverse is apparently the case. Nutrient salts always modify hydration capacity. The author is directing his studies toward an analysis of the phenomena of plant growth based on the physicochemical properties of colloid gels, especially with reference to imbibition and swelling.—*Lon A. Hawkins.*

2224. Seifriz, William. **The length of the life cycle of a climbing bamboo. A striking case of sexual periodicity in Chusquea abietifolia Griseb.** Amer. Jour. Bot. 7: 83-94. *5 fig.* 1920.—The author notes the fact that several species of bamboo display sexual periodicity, flowering at intervals of a definite number of years. *Chusquea abietifolia,* of the Blue Mountains of Jamaica, went through such a flowering period in 1918, during which practically all individuals blossomed, produced seed and died. The next year the species was represented only by seedlings, except for one small area discovered by the author in an unusually arid situation where the plants were still thriving and flowerless. The only previous flowering period recorded for this species was in 1885, thus establishing a cycle of 33 years, very similar to that of the Indian *Bambusa arundinacea,* which is 32 years.—The author discusses possible factors which may cause such a periodicity and shows that seasonal differences, particularly in moisture, are probably insufficient to explain them, and suggests that the problem may be of the same nature as that of puberty and senility in organisms. No sufficient explanation is as yet forthcoming for the remarkable fact that fully 98 per cent of the individuals of the species come into flower simultaneously over a great stretch of country.—*E. W. Sinnott.*

2225. SIEGLINGER, JOHN B. **Temporary roots of the sorghums.** Jour. Amer. Soc. Agron. 12: 143–145. 1920.—Under greenhouse conditions the radicle is the only temporary root developed in sorghums. Shortly after germination the first node develops below the surface and from this node the first permanent roots develop.—*F. M. Schertz.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

2226. BREMEKAMP, C. E. B. **Theorie des Phototropismus.** [The theory of phototropism.] Recueil Trav. Bot. Néerland. 15: 123–184. *Fig. 1–14.* 1918.

2227. JIVANNA RAO, P. S. **Note on the geotropic curvature of the inflorescence in Eichornia speciosa-Kunth (water hyacinth).** Jour. Indian Bot. 1: 217–218. *1 fig.* 1920.—Bending of the floral axis begins immediately after the flowers close, and results in complete submergence of the inflorescence. The reaction is geotropic rather than hydrotropic.—*Winfield Dudgeon.*

GERMINATION, RENEWAL OF ACTIVITY

2228. BASTIN, S. L. **Colored glass for seed germination.** Sci. Amer. 122: 165. *1 fig.* 1920.

2229. DUYSEN, F. **Ueber die Keimkraftdauer einiger landwirtschaftlich Wichtiger Samen.** [The vitality of certain agriculturally important seeds.] Illustrierte Landw. Zeitg. 39: 282–283. 1919.—See Bot. Abstr. 5, Entry 1132.

2230. MARTIN, J. N., AND L. E. YOCUM. **A study of the pollen and pistils of apples in relation to the germination of the pollen.** Proc. Iowa Acad. Sci. 25: 391–410. *Fig. 165–166.* 1920.—See Bot. Abstr. 5, Entry 1759.

TEMPERATURE RELATIONS

2231. BANCROFT, WILDER D. [Rev. of: GRIFFETHS, EZER. **Methods of measuring temperature.** *88 x 17 cm., xi + 174 p.* Philadelphia: J. B. Lippincott Company, 1918.] Jour. Phys. Chem. 23: 286–288. 1919.—The review is chiefly concerned with methods for measuring temperatures above the boiling point of water.—*H. E. Pulling.*

2232. BRONFENBRENNER, J., W. T. BOVIE, AND ESTELLE M. WOLFF. **A simple arrangement for measuring the rate of heat penetration during sterilization.** [Abstract.] Abstr. Bact. 3: 6. 1919.—A detailed description of the apparatus, with drawings, will appear in the Journal of Industrial and Engineering Chemistry.—*Authors.*

2233. CROCKER, WILLIAM. **Optimum temperatures for the after-ripening of seeds.** Proc. Assoc. Official Seed Analysts of North America 1919: 46–48. 1919.—See Bot. Abstr. 5, Entry 1123.

2234. SHREVE, EDITH BELLAMY. **The rôle of temperature in the determination of the transpiring power of leaves by hygrometric paper.** Plant World 22: 172–180. *1 fig.* 1919.—Thermoelectric measurement of the temperature of the cobalt chloride slip used in determining the index of transpiring power in plants shows that the temperature of the slip varies so little from that of the air temperature that the latter may be used in calculating the indices. Similarly, in standardizing the cobalt slips over a porous evaporating surface in a small closed room, the air temperature may be used instead of the temperature of the slip without significant error.—*Charles A. Shull.*

RADIANT ENERGY RELATIONS

2235. DUBOIS, RAPHAEL. **Luminous living creatures.** Sci. Amer. Monthly 1: 9–12. *7 fig.* 1920. [Translated from Science et la Vie (Paris).]—Devoted mainly to a discussion of luminous animal life; but briefly considers luminous fungi and certain photobacteria.—*Chas. H. Otis.*

2236. Pulling, Howard E. **Sunlight and its measurement.** Plant World 22: 151–171, 187–209. *5 fig.* 1919.—The author presents a general discussion of the nature, distribution, and variability in amount of solar radiation reaching the earth, as modified by extra-terrestrial influences, and by atmospheric conditions. Three general methods of measuring radiation are discussed: radiometry, photometry, and actinometry. The difficulties involved in each method, their limitations, the precautions to be observed in manipulating the instruments, and the interpretations of measurements are considered. An extensive bibliography accompanies the text.—*Charles A. Shull.*

2237. Raunkiaer, C. **Über das biologische Normalspektrum. [The biological "normal spectrum."]** Kgl. Danske Vidensk. Selskab. Biol. Meddel. 1: 1–18. 1918.

2238. Schanz, Fritz. **The effects of light on plants.** Sci. Amer. Monthly 1: 12–16. 1920. [Translated from the *Biologisches Centralblatt* (Berlin).]—Some of the topics considered are: how light affects the albumens of plants; substances which act as catalyzers; the meaning of colors in flowers; and effect on plants of varying intensity of light.—*Chas. H. Otis.*

TOXIC AGENTS

2239. Breasola, M. **Le devitalizzazione dei semi di Cuscuta. [The killing of Cuscuta seeds.]** Staz. Sperim. Agrarie Italiane 52: 193–207. 1919.—See Bot. Absts. 5, Entry 1112.

2240. Ciamician, G., and C. Ravenna. **Sul contegno di alcune sostanze organishe nei vegetali. Nota XI. [On the behavior of certain organic substances in plants. XIth contribution.]** Gaz. Chim. Italiana 49: 83–126. *Pl. 1–2, fig. 1–20.* 1919.—The present contribution is divided in two parts. Part I. The authors study the effect on the growth of beans (germinated in cotton and distilled water) of repeated doses of one per thousand solutions of the substances investigated. In nearly every case when galvanized iron containers were used instead of glass, there was a distinct reduction in toxicity of the compounds studied. The results may be summarized as follows: Mono-methyl-amine was slightly toxic while di-methyl-amine and tri-methyl-amine were more toxic in the order named. Ammoniacal salts, urea, pyridine and uric acid show no toxic action in the conditions studied while tetra-methyl-ammonium tartrate and tetra-ethyl-ammonium tartrate, piperidine, nicotine, and theobromine are very slightly, if at all, toxic. The function of the methyl group in toxicity is brought out very plainly by the fact that potassium salicylate is very slightly toxic while methyl salicylate is distinctly toxic. A list is given of the substances found to be toxic under the conditions mentioned. Part II. This section is given to the study of the oxidative changes undergone by some organic compounds when incubated with spinach pulp in the presence of adequate oxygen and of small amounts of toluol as an antiseptic. Attention is also given to the inoculation of some compounds into living maize and to the changes undergone by these in the living organism. Two examples will indicate the direction of the results. Succinic acid, which by the action of light is transformed to acetic aldehyde, acetic and propionic acids, also glyoxal, is changed by plant enzymes into acetic aldehyde and a compound decomposed by emulsion. Lactic acid in the light yields acetic acid and acetic aldehyde, while only the latter compound results when acted upon by enzymes. In respect to the above the general conclusions is that the enzymes of spinach leaves have a selective oxidizing function which in some cases does not equal the action of light, though surpassing it in other cases. With respect to the behavior of organic compounds inoculated into maize and tobacco the results obtained point to the fact that compounds very resistant to oxidation, such as pyridine and benzoic acid, are only found in very small amounts in the extract of the plats after inoculation. The strong oxidizing power of plants and especially of living plants may not be due to the ordinary oxydases, but more probably to protoplasmic enzymes insoluble in water and apparently also in glycerin.—*A. Bonazzi.*

2241. Malisoff, William, and Gustav Egloff. **Ethylene.** Jour. Phys. Chem. 23: 65–138. 1919.—This is a collection "on a logically convenient basis" of the physical and chemical data on ethylene, including references to its effects on plants. A bibliography of 324 citations is appended.—*H. E. Pulling.*

2242. MAQUENNE, L., AND E. DEMOUSSY. **Sur la distribution et la migration du cuivre dans les tissus des plantes vertes. [The occurrence and translocation of copper in the tissues of green plants.]** Compt. Rend. Acad. Sci. Paris 170: 87–93. 1920.—Chemical analyses were made of various parts of 27 types of cultivated herbaceous and woody plants and in some cases of the expressed sap of such parts with a view to determining the amount of copper present. The cupro-zinc-ferrocyanid method was employed, 3 grams of dry vegetable matter being used for each test. Copper is found to be present in all plants tested and in all the parts which were analyzed. The amount varies from 0.25 mgm. per liter of centrifuged expressed sap of potato to 40 mgm. per kilogram of dry leaf substance of lettuce. Copper is found in greatest abundance in cells which are active in growth or metabolism, hence the authors conclude that its translocation is controlled by nutritive processes or processes accompanying metabolism.—*C. H. and W. K. Farr.*

2243. WINSLOW, C.-E. A., AND DOROTHY F. HOLLAND. **The disinfectant action of glycerol in varying concentrations.** Proc. Soc. Exp. Biol. and Med. 16: 90–92. 1919.—Glycerol in 9 per cent solution exerts no appreciable effect upon the viability of *Bacillus coli*, but in strengths of 28–100 per cent there is a progressively increasing "disinfecting" action, nine-tenths of the bacteria being killed in 3 hours at 100 per cent.—*R. W. Webb.*

2244. WOGLUM, R. S. **Is it safe to fumigate while trees are in bloom?** California Citrograph 5: 190. *1 fig.* 1920.—See Bot. Absts. 5, Entry 1788.

MISCELLANEOUS

2245. BANCROFT, WILDER D. **The colors of colloids. II. Reflection and refraction.** Jour. Phys. Chem. 23: 1–35. 1919. **III. Reflection and visibility.** *Ibid.* 23: 154–185. 1919. **IV. Interference and diffraction.** *Ibid.* 23: 253–282. 1919. **V. Metallic and vitreous lustre.** *Ibid.* 23: 289–347. 1919. **VI. Blue eyes.** *Ibid.* 23: 356–361. 1919. **VII. Bluefeathers.** *Ibid.* 23: 365–414. 1919. **VIII. Metallic colors.** *Ibid.* 23: 445–468. 1919. **IX. Colloidal metals.** *Ibid.* 23: 554–571. 1919. **X. Glasses and glazes.** *Ibid.* 23: 603–633. 1919. **XI. Gems.** *Ibid.* 23: 640–644. 1919.—This is a collection of excerpts and abstracts, which includes numerous examples, some biological, chiefly from standard works, on the physical optics of the phenomena incompletely indicated by the sub-titles.—*H. E. Pulling.*

2246. BANCROFT, WILDER D. [Rev. of: ALEXANDER, JEROME. **Colloid chemistry. An introduction with some practical applications.** *17 x 12 cm., vi+90 p.* D. Van Nostrand Co.: New York, 1919.] Jour. Phys. Chem. 23: 441–442. 1919.

2247. BANCROFT, WILDER D. [Rev. of: BECHHOLD, H. **Colloids in biology and medicine.** Translated by J. G. M. BULLOWA. *24 x 16 cm., xiv+484 p.* D. Van Nostrand Co.: New York, 1919.] Jour. Phys. Chem. 23: 513–515. 1919.—"It is a great pleasure to welcome an English translation of this excellent book."—*Reviewer's summary.*

2248. BANCROFT, WILDER D. [Rev. of: OSTWALD, WOLFGANG. **A handbook of colloid chemistry.** (Translated by M. H. FISCHER with notes added by EMIL HATSCHEK.) *2nd ed., 14 x 17 cm., xvi+284 p.* P. Blakiston's Son & Co.: Philadelphia, 1919.] Jour. Phys. Chem. 23: 364. 1919.—With a few exceptions, chiefly notes on the viscosity of colloids, the volume is the same as the first edition and does not represent the present knowledge of the subject.—*H. E. Pulling.*

2249. BANCROFT, WILDER D. [Rev. of: PRIDEAUX, E. B. R. **The theory and use of indicators.** *22 x 15 cm., ix+275 p.* D. Van Nostrand & Co.: New York, 1918.] Jour. Phys. Chem. 23: 203–204. 1919.

2250. BANCROFT, WILDER D. [Rev. of: WILLOWS, R. S., AND E. HATCHEK. **Surface tension and surface energy.** *2nd ed., 19 x 13 cm., viii+114 p.* P. Blakiston's Son & Co.: Phila-

delphia, 1919.] Jour. Phys. Chem. 23: 443. 1919.—"Books like these are interesting and worth while, but condensation seems to lead more often than necessary to inaccuracy of statement."—*Reviewer's summary.*

2251. Cahles, P. **La prune d'ente et les pruneaux d'Agen: Explication scientifique de leur preparation et des moyen de les conserver temporairement pour l'Europe et de facon indéfinie pour l'exportation mondiale.** [A scientific account of methods used in preparing "prunes of Agen" for foreign and domestic consumption.] Mém. Soc. Sci. Phys. Nat. Bordeaux VII. 2: 219-232. 1918.—See Bot. Absts. 5, Entry 1866.

2252. Kopeloff, Nicholas. **Micro-organisms in the sugar factory.** Louisiana Planter and Sugar Manufacturer 64: 14-15. 1920.—This is in continuation of the experiments published in Louisiana Agric. Exp. Sta. Bull. 166. 1919. The results obtained in 1919 agree with those of the previous year. In the sugar factory, the greatest number of molds and bacteria is found in the raw juice. The clarification process reduces the number in the other sugar products.—*C. W. Edgerton.*

2253. Laborde, J. **Recherches sur le vieillissement du vin.** [Aging of wine.] Mém. Soc. Sci. Phys. Nat. Bordeaux VII. 2: 37-75. 1918.

2254. MacInnes, L. T., and H. H. Randell. **Diary produce, factory premises and manufacturing processes: The application of scientific methods to their examination.** Agric. Gaz. New South Wales 31: 255-264. *9 fig.* 1920.—The authors give the results of an investigation relative to the bacterial flora of dairy products at various stages of manufacture and of the various substances with which the products come in contact, including the air of the butter factory. Not only are plat counts given of the bacteria, yeasts, and molds, but a classification is made relative to the physiological action of the various organisms. Suggestions are also presented in regard to creamery methods.—*L. R. Waldron.*

2255. Murray, Benjamin L. **Standards and tests for reagent chemicals.** *400 p.* Van Nostrand Co.: New York, 1920.

2256. Seidell, Atherton. **Solubilities of inorganic and organic compounds.** *2nd ed., 867 p.* Van Nostrand Co.: New York, 1920.

SOIL SCIENCE

J. J. Skinner, *Editor*
F. M. Schertz, *Assistant Editor*

ACIDITY AND LIMING

2257. Bancroft, Wilder D. [Rev. of: Brideaux, E. B. R. **The theory and use of indicators.** *22 x 13 cm. ix + 375 p.* D. Van Nostrand & Co.: New York, 1917. $5.00.] Jour. Phys. Chem. 23: 203-204. 1919.

2258. Corson, Geo. E. **The use of lime on Iowa soils.** Iowa Agric. Exp. Sta. Circ. 58. *7 p.* 1919.

2259. Fippin, Elmer O. **The status of lime in soil improvement.** Jour. Amer. Soc. Agron. 12: 117-124. 1920.—A general discussion of liming of soils.—*F. M. Schertz.*

2260. Howard, L. P. **The reaction of soil as influenced by the decomposition of green manure.** Soil Sci. 9: 27-39. 1920.—The lime requirements of land on which corn has grown since 1894 but a part of which has for about 25 years grown rye or legumes shows that no acidity has developed from the use of rye as a cover crop. The legumes, however, have during

the same time considerably increased the lime requirement. In plot experiments, with the same soil, green rye increased the lime requirement twice as much as an equal weight of green clover.—*W. J. Robbins.*

2261. HOWARD, L. P. **The relation of certain acidic to basic constituents of the soil affected by ammonium sulfate and nitrate of soda.** Soil Sci. 8: 313–321. 1919.—Studies made on limed and unlimed plots which have been treated with ammonium sulfate or sodium nitrate show that the hydrogen ion concentration in the unlimed ammonium sulfate treated plot is very similar (about P_H 4) to that produced by even quite large additions of aluminium salts to buffer solutions. Extractions with potassium chloride solution and 0.2 normal hydrochloric acid solution remove relatively large amounts of aluminum and iron from the soil of the unlimed ammonium sulfate treated plot.—*W. J. Robbins.*

2262. LIPMAN, J. G., AND A. W. BLAIR. **The lime factor in permanent soil improvement. 1. Rotation without legumes.** Soil Sci. 9: 83–90. 1920. **2. Rotation with legumes.** *Ibid.* 9: 91–114. 1920. A 5-year rotation of corn, oats, wheat and 2 years of timothy was grown on plots which were unlimed or which received 1 ton of lime as carbonate per acre for the first 5 years and 2 tons of lime per acre for the second 5 years. The total yields of dry matter and of nitrogen for the 10-year period for the limed and unlimed plots were essentially the same. Analyses of the soil at the beginning of the experiment and after each 5-year period showed a loss of nitrogen from both limed and unlimed plots but a greater loss from the limed plots. Four 5-year rotations each containing a leguminous crop were carried out on plots which were unlimed or which received 1000, 2000 or 4000 pounds per acre of calcium or magnesium limestone. During a 10-year period, the limed plots yielded distinctly larger crops and more total nitrogen than the unlimed. Analyses of the soil show in most cases an amount of nitrogen in the limed plots equal to or greater than that in the unlimed. The magnesium limestone was slightly superior to the calcium limestone.—*W. J. Robbins.*

2263. MACINTIRE, W. H. **The liberation of native soil potassium induced by different calcic and magnesic materials.** Soil Sci. 8: 337–395. *Pl. 1. 19 fig.* 1919.—The results of five years experiments show that practical or economical applications of burnt calcareous limestone, burnt dolomitic limestone, ground calcareous limestone or ground dolomitic limestone will not effect a direct chemical liberation of native soil potassium.—*W. J. Robbins.*

2264. STUTZER, A. **Beiträge zur Dungekalkfrage.** [A contribution to the calcium fertilizer problem.] Illustrierte Landw. Zeitg. 39: 333–334. 1919.

2265. [TANSLEY, A. G.] **Investigations on soil.** [Rev. of: HARTWELL, B. L., F. R. PEMBER AND L. P. HOWARD. **Lime requirement as determined by the plant and the chemist.** Soil Sci. 279–282. 1919.] Jour. Ecol. 7: 214. 1919.

2266. WALKER, SETH S. **The effect of aeration and other factors on the lime requirement of a muck soil.** Soil Sci. 9: 77–81. 1920.—Air-drying a black muck soil increases the lime requirements. The increase in lime requirements was less in a stirred moist portion than in a water covered undisturbed portion. The lime requirement of stored moist samples increased but that of stored dry samples decreased. Soil neutralized with calcium carbonate and stored moist showed a greater increase in lime requirement than unneutralized soil.—*W. J. Robbins.*

FERTILIZATION

2267. BECKWITH, CHARLES C. **The effect of certain nitrogenous and phosphatic fertilizers on the yield of cranberries.** Soil Sci. 8: 483–490. 1919.—See Bot. Abstr. 5, Entry 1723.

2268. BLAIR, A. W. **Barium phosphate experiments.** Amer. Fert. 52: 142–144. 1920.—Experiment was made comparing barium phosphate and other phosphate materials. Beans and corn were grown. Practically no increased crop production was secured from the use of barium phosphate.—*J. J. Skinner.*

2269. Forman, L. W. **Reclaiming Iowa's "push" soils.** Iowa Agric. Exp. Sta. Bull. 191: 162–176. *5 fig.* 1919.

2270. Frear, William. **Some notes of fertilizers and the war.** Bull. Pennsylvania Dept. Agric. 1: 29–33. 1918.—A brief summation of the past and present sources of supply of potash, nitrogen and phosphoric acid with remarks concerning the difficulties which are being encountered among the domestic manufactures of fertilizers.—*C. R. Orton.*

2271. Harrison, W. H. **Report of the Imperial Agricultural Chemist.** Sci. Rept. Agric. Res. Inst. Pusa 1918–19: 35–45. 1919.—A summary of the work carried on during the year at the Agricultural Research Institute, Pusa, India, and a program for 1919–20. From studies in the method of retention of superphosphate in soil, it is concluded that the phosphate is held in non-calcareous soils by absorption, and in calcareous soils by chemical combination, and therefore the range of application and method of employment of superphosphate as fertiliser must be different in the two types of soil.—Sugar cane (*Saccharum officinarum*) stored in windrows in the North-West Frontier Province shows increasing content of both glucose and sucrose, but other changes render the final sucrose yield nearly constant with continued storage. Immediately following heavy rainfall there is rapid deterioration of the cane.—In fertiliser experiments with rice (*Oryza sativa*), green manure combined with ammonium sulphate gave an increase in yield almost exactly proportional to that given by sulphate alone. —*Winfield Dudgeon.*

2272. Jacob, A. **Beeinträchtigung der Bodenstruktur durch Kochsalz-Düngung.** [Injury of the soil structure through applications of sodium chloride.] Illustrierte Landw. Zeitg. 39: 420–421. 1919.

2273. Jordan, W. H., and G. W. Churchill. **An experience in crop production.** New York Agric. Exp. Sta. [Geneva] Bull. 465. *20 p.* 1919.—See Bot. Absts. 5, Entry 1164.

2274. Mitscherlich, Eilh. Alfred. **Zum Gehalt der Haferpflanze an Phosphorsäure und seinen Beziehungen zu der durch eine Nährstoffzufuhr bedingten Ertragserhöhung.** [On the phosphoric acid content of the oat plant and its relation to the increased yield resulting from the addition of nutrients.] Jour. Landw. 67: 171–176. *1 fig.* 1919.

2275. Münter. **Pflanzenanalyse und Düngerbedürfnis des Bodens.** [Plant analysis and fertilizer requirement of the soil.] Jour. Landw. 67: 229–266. 1919.—The following results reported were obtained on the Lauchstedt loessal loam soil with winter wheat when fertilised with different materials: Fertilizing with potassium and phosphoric acid increased the silicic acid content of the straw, fertilizing with nitrogen decreased it.—Fertilising with potassium and phosphoric acid decreased the nitrogen, calcium and magnesium content of the straw; nitrogen increased it.—The nitrogen content in the grain was decreased by potassium and increased by phosphoric acid.—The chemical analysis of the wheat plants of a fertilised plat gave no sure indication of the fertilizer need of the soil.—The better the growing season, the more does nitrogen control the formation of organic substance, especially in the grain, therewith the total calcium, magnesium, potassium and phosphoric acid taken up. In poorer growing seasons potassium influences more the plant production. Phosphoric acid is apparently indifferent.—Nitrogen, potassium or phosphoric acid used alone first influences the straw.—The weather condition of any year exerts a strong influence upon the taking up of nitrogenous matter, sometimes even more than the fertilizer applied, thereby rendering the percentages of nitrogen resulting from incomplete fertilizer applications unreliable in indicating fertilizer needs of the soil.—The nitrogen requirement of the Lauchstedt soil may be determined by the quantities of N, CaO, and MgO in the wheat plant. When the sum of N, CaO and MgO in grain and straw for 1 hectar amounts to more than 90 kgm., or in grain more than 60 kgm., or in straw more than 30 kgm., then there is sufficient nitrogen present in the soil.—If after subtracting the sum of the N+CaO+MgO percentages from the potassium percentage the result is positive, the potassium content of the soil is sufficient for plant produc-

tion, if it is negative, potassium is lacking.—The plants from the plats without fertilizer and with full fertilizer usually contain the same percentages of N and P_2O_5. Only the potassium content of the straw is higher in the fully fertilized plot than in the unfertilized plot. A comparison of the plant analysis of unfertilized and fully fertilized plots gives no information as to the plant food in a soil. The fertilizer requirement of a soil becomes evident if the plants of two incompletely fertilized plots are investigated, e.g., plots receiving (1) N, and (2) $P_2O_5+K_2O$ applications of fertilizer. If thereupon the ratio of $N:K_2O$ is less than 100:200 potassium is lacking; if it is wider, then sufficient potassium is present. If the ratio $N:P_2O_5$ from the nitrogen plot is wider than 100:35 it lacks in phosphoric acid; if less, then no lack exists. If from the $P_2O_5+K_2O$-plot the ratio of $N:P_2O_5$ is less than 100:60 it lacks in nitrogen. If the ratio of $SiO_2:N$ is wider than 100:6 there is not sufficient N present; if less, the N content is sufficient for wheat growth. If the N percentage in the wheat straw found for the N-plot is considered as 100, then enough N is present in the soil of the $P_2O_5+K_2O$-plot when the ratio of the 2 percentages is less than 100:60.—*C. E. Leighty.*

2276. REIMER, F. C., AND H. V. TARTAR. **Sulfur as a fertilizer for alfalfa in Southern Oregon.** Oregon Agric. Exp. Sta. Bull. 163. *40 p. 9 fig.* 1919.—Various fertilizers containing sulfur, such as flowers of sulfur, superphosphate, gypsum, iron sulfate, ammonium sulfate, potassium sulfate, magnesium sulfate and sodium sulfate, on various types of soil generally increased the yields of clover and alfalfa very greatly. Most of the soils experimented with were well supplied with potassium, calcium, magnesium, and iron but contained only limited amounts of sulfur. None of them were acid, and none contained noticeable amounts of alkali. Analyses of the alfalfa plants which had received applications of sulfate fertilizers showed that they had larger root systems with more nodules on them and that they contained much more sulfur, more protein, and more nitrogen. In the hay from the sulfur fertilized plats from 71 to 79 per cent of the sulfur was in the organic form, the remainder in the sulfate form, while from the unfertilized plats it was all in the organic form. Up to the present time the returns from the use of superphosphate have not been greater than those from calcium sulfate alone. Flowers of sulfur produce as marked results as does calcium sulfate but a somewhat longer period is required since it must first be changed to the sulfate form before it can be utilized by the plants. On soils deficient in lime, flowers of sulfur should be used only in conjunction with liberal quantities of lime or rock phosphate to avoid conditions of acidity.—*E. J. Kraus.*

SOIL BIOLOGY

2277. BORNEBUSCH, C. H. **Bedømmelse om Skovjordens Godhed ved Hjælp af Bundfloraen.** [Judging the quality of soil by the flora.] Dansk Skovforenings Tidsskr. 5: 37-50. 1920.

2278. FELLERS, C. R., AND F. E. ALLISON. **The protozoan fauna of the soils of New Jersey.** Soil Sci. 9: 1-25. *Pl. 1-4.* 1920.—Protozoa were found in all soils examined, the number of species ranging from 2 to 28. About 5000 per gram of soil were found. It is believed that in normal New Jersey soils, the protozoa exist mainly in a nontrophic state.—*W. J. Robbins.*

2279. GEILMANN, [—]. **Untersuchung des Bakteriennährpräparates der Superphosphatfabrik Nordenham.** [Investigation of the bacterial food preparation of the Nordenham superphosphate factory.] Jour. Landw. 67: 209-227. 1919.—The superphosphate factory at Nordenham has introduced a peat preparation which is designed to furnish food material to soil bacteria and to stimulate them to greater activity. The preparation itself is not supposed to act as a fertilizer, but only to bring about nitrogenous fertilization through increased bacterial activity. Better physical condition and higher productive power of the soil and prevention of lodging of grain crops should then result. These investigations have shown: (1) the absolute ineffectiveness of the preparation; (2) that an increase in nitrogen content of the soil does not result from use of the preparation; (3) that it does not act in the least as nitrogenous fertilizer; and (4) that it does not result in increased bacterial activity either in the soil or in nutrient solutions, but that any good results are due to the $CaCO_3$ content.—*C. E. Leighty.*

2280. GIBBS, W. M. **The isolation and study of nitrifying bacteria.** Soil Sci. 8: 412–481. *4 pl., 1 fig.* 1919.—See Bot. Absts. 5, Entry 2188.

2281. GREIG-SMITH, R. **Contributions to our knowledge of soil-fertility. No. XVI. The search for toxin-producers.** Proc. Linnean Soc. New South Wales 34: 142–190. 1918.—This paper is one of a series on the subject of soil toxins. In the earlier papers it was shown that soil extracts sometimes contain bacterio-toxic substances. Investigations on the possibility that these toxic substances are formed by bacteria, moulds and amoebae are reported. These organisms were grown in various media and under varying conditions; and in all cases, the signs of toxicity to the test organism *Bacillus prodigiosus* which became manifest could be attributed to an alteration in the reaction of the media. This toxic effect was found to be of a different order from that previously noted with soil extracts.—*E. Truog.*

2282. HUTCHINSON, C. M. **Report of the Imperial Agricultural Bacteriologist.** Sci. Rept. Agric. Res. Inst. Pusa 1918–19: 106–114. 1919.—The report summarizes investigations in progress during the year under report in nitrification; nitrogen fixation; green manuring; biological analyses of soils; indigo manufacture; pebrine disease of the silkworm; and sterilization of water.—*Winfield Dudgeon.*

2283. LYON, T. L., J. A. BIZZELL, AND B. D. WILSON. **The formation of nitrates in a soil following the growth of red clover and timothy.** Soil Sci. 9: 53–64. 1920.—Cylinders of soil treated with dried blood, acid phosphate, potassium chloride, and ground limestone and planted to timothy or clover were leached with distilled water during the period of the growth of the crops and a 7 months fallow period thereafter. Twice as much nitrogen was present in the drainage water from the clover pots as the timothy pots. There was little difference in the quantities of nitrogen leached from the timothy and clover soils during the growth of those crops but during the first two months of fallowing, ten times as much nitrogen was leached from the clover soil as from the timothy soil. Corn and oats planted after one month fallowing yielded twice as much in the clover soil as in the timothy soil. The total nitrogen in the drainage water and in the corn and oats was over twice as much in the case of the clover soil as in the timothy soil.—*W. J. Robbins.*

2284. MIEGE, E. **La desinfection du sol.** [The disinfection of the soil.] Prog. Agric. et Vitic. 74: 133–140. 1920.—A discussion of results obtained by the use of a number of antiseptic substances on the yields of various plants. Generally, most of these substances have increased very markedly the yields of these plants. Sulfur and copper sulfate have been very efficacious on potatoes; lysol and formaldehyde were very favorable on carrots. Toluol, charcoal, potassium permanganate and calcium hypochlorite have also given good results on truck crops.—*L. Bonnet.*

2285. SMITH, T. A. J. **Manures and fertilizers for tobacco.** Jour. Dept. Agric. Victoria 17: 674–675. 1919.—The need of phosphoric acid for Victorian soils is shown. The soils are naturally rich in potash, and nitrogen is secured by growing leguminous crops. Acid phosphate is recommended, applying at the rate of 100 to 200 pounds per acre. A crop of tobacco yielding 1875 pounds per acre removes 65 pounds of nitrogen, 89 pounds potash and 8 pounds of phosphoric acid.—*J. J. Skinner.*

2286. WAKSMAN, SELMAN A. **Microbiological studies on the cranberry bog soils. I. The effect of liming upon the microbial population of the cranberry soil.** [Abstract.] Absts. Bact. 3: 2. 1919.—"The addition of ground limestone, at the rate of 8000 pounds per acre, to a Savannah bottom cranberry bog resulted in a distinct change in soil reaction and microbial flora, accompanied by a twofold increase in the crop for the four years after the lime had been applied. This study was made on the fourth year after the application of lime.—The hydrogen ion concentration of the unlimed soil was P_H=5.2 to 5.4; the P_H of the limed soil was equal to 6.2 to 6.4. Ammonia was found in traces in both soils. The limed soil contained nitrites and a trace of nitrates, while the unlimed soil had no nitrates and practically no nitrites, indi-

cating a more active nitrification resulting from the change of reaction. On adding the two soils to nitrifying solutions, nitrification was found to be more active in the limed than in the unlimed soil. The aerobic nitrogen-fixing organisms, *Azotobacter*, were found in the limed soil, but not in the unlimed soil. The unlimed soil contains 6000 bacteria and 5000 molds (spores and pieces of mycelium) per gram, while the limed soil contained 20,000 bacteria and 1500 molds per gram, showing the decrease in acidity resulted in an increase in the bacterial and a decrease in the mold flora." [Author's abstract of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2287. WHITING, ALBERT L., AND WARREN R. SCHOONOVER. **The comparative rate of decomposition of green and cured clover tops in soil.** Soil Sci. 9: 137–149. 1920.—Green clover at the rate of 50 tons per acre or cured clover in equivalent amounts was mixed with a brown silt and incubated in tumblers or 1 gallon pots. Under aerobic conditions the green and cured clover underwent the same type of decomposition but the curing retarded the decomposition as measured by ammonification, nitrification and loss of carbon. Under anaerobic conditions, the types of decomposition of green and cured clover were very different.—*W. J. Robbins.*

FERTILIZER RESOURCES

2288. ANONYMOUS. **German potash production.** Amer. Fertilizer 52: 70. 1920.—During January, 1920, the potash production in Germany was 550,000 tons.—*J. J. Skinner.*

2289. BANCROFT, WILDER D. [Rev. of: LLOYD, STRAUSS L. **Mining and manufacture of fertilizing materials and their relation to soils.** *19 x 14 cm., vi+165 p.* D. Van Nostrand Co.: New York, 1918. $2.00.] Jour. Phys. Chem. 23: 442. 1919.

2290. DE TURK, ERNEST. **Potassium-bearing minerals as a source of potassium for plant growth.** Soil Sci. 8: 269–301. 1919.—Applications of 2 tons per acre of orthoclase, microline, leucite and alunite to limed peat soil increased the yield of buckwheat from 20 to 35 per cent. Lepidolide was detrimental probably due to an excess of soluble lithium. The potassium in dune sand crushed to pass a 100 mesh sieve (100 meshes to an inch) will produce 0.114 pound of soluble potassium.—*W. J. Robbins.*

2291. FROST, A. C. **The phosphate production in Algeria.** Amer. Fertilizer 52: 70. 1920. —There were 201,013 tons of phosphate produced in Algeria for the first three quarters of 1919. —*J. J. Skinner.*

2292. SMITH, T. A. J. **The importance of lime in agriculture.** Jour. Dept. Agric. 17: 682–683. 1919.—The forms of lime are described. Large deposits of limestone are found in Northern, Northeastern, Western and Gippsland Districts of Victoria.—*J. J. Skinner.*

SOIL ANALYSIS

2293. AMES, J. W., AND C. J. SCHOLLENBERGER. **Calcium and magnesium content of virgin and cultivated soils.** Soil Sci. 8: 323–335. 1919.—Determinations of the total calcium and magnesium, the calcium and magnesium soluble in 0.2 normal nitric acid, the carbonates and the reaction of virgin and cultivated soils from 23 locations in Ohio show that there is a concentration of readily soluble calcium and magnesium at the surface in most virgin soils. When the proportion of the total bases which is soluble is high the soil is likely to contain more carbonate and to be more basic to tests.—*W. J. Robbins.*

2294. [TANSLEY, A. G.] **Investigations on soil.** [Rev. of: HIBBARD, P. L. **Changes in composition of the soil and of the water extract of the soil following the addition of manure.** Soil Sci. 7: 259–272. 1919.] Jour. Ecol. 7: 214–215. 1919.

SOIL CLASSIFICATION

2295. Beck, M. W., M. Y. Longacre, and others. **Soil survey of Howard County, Arkansas.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-57. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2296. Carter, W. T., J. M. Snyder, and O. C. Bruce. **Soil survey of Baltimore County, Maryland.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-40. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2298.

2297. Cobb, W. B., E. S. Vanatta, L. L. Brinkley, S. F. Davidson, and F. N. McDowell. **Soil survey of Beaufort County, North Carolina.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 7-39. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2298. Davis, L. Vincent, and H. W. Warner. **Soil survey of Buena Vista County, Iowa.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-36. *Fig. 1, 1 map (colored).* 1919.—Buena Vista County is situated in the northwestern part of Iowa in a prairie region. The topography is flat to gently rolling. Morainic deposits contributed to the more rolling topography. The ruling elevation of the county is 1537 feet above sea level.—The Missouri-Mississippi river drainage divide passes through the county in a general north and south direction. The incipient drainage systems arise in poorly drained areas. Artificial drainage is generally necessary for satisfactory cropping.—Transportation facilities are furnished by five railroads.—The mean annual precipitation is 29.80 inches, and is distributed favorably for crops. The mean annual temperature is 46.30°F. The average growing season is 151 days. Numerous low-lying areas are particularly subject to early frost in fall.—Agriculture which is the principal industry in Buena Vista County consists mainly in the production of corn, oats and hay and the raising and feeding of hogs, cattle, horses and sheep. Corn is the principal crop.—The soils of the county are mainly of glacial origin. The soils are predominantly dark-colored. In the poorly drained areas the lime content is often high. Alluvial soils are found on the terraces along the Little Sioux River and on the first bottoms of those natural drainage ways of sufficient size to have developed flood plains. Several areas of Muck and Peat are found in the county.—Steep slopes of the glacial soils frequently are forested, principally with bur oak, soft maple, elm, basswood and red oak. In the muck and peat areas water loving flora are still to be found in various stages of decomposition.—Eighty-five per cent of the population is rural. Artificial drainage has permitted the extension of the limits of arable land.—*F. B. Howe.*

2299. Deeter, E. B., and F. H. Cohn. **Soil survey of Faulkner County, Arkansas.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-33. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2300. Eckmann, E. C., and A. T. Strahorn. **Soil survey of Anaheim Area, California.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1916: 5-77. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2301. Goodman, A. L., A. H. Meyer, R. W. McClure, and B. H. Hendrickson. **Soil survey of Amite County, Mississippi.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-37. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2302. Hall, E. C., and E. I. Angell. **Soil survey of Wapello County, Iowa.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-42. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2303. JONES, E. M., AND A. T. SWEET. **Soil survey of Covington County, Mississippi.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-30. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2304. KRUSEKOPF, H. H., J. H. AGEE, AND R. H. HALL. **Soil survey of Callaway County, Missouri.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1916: 5-37. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2305. MAXSON, E. T., C. E. DEARDORFF, W. A. ROCKIE AND J. M. SNYDER. **Soil survey of Burke County, Georgia.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-29. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2306. MEYERS, A. H., AND T. H. BENTON. **Soil survey of Henry County, Iowa.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-31. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2307. MEYER, A. H., AND B. H. HENDRICKSON. **Soil survey of St. Martin Parish, Louisiana.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-31. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2308. NELSON, J. W., C. J. ZINN, AND OTHERS. **Soil survey of the Los Angeles Area, California.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1916: 5-76. *3 pl., 1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2309. ROGERS, R. F., AND W. G. SMITH. **Soil survey of Calhoun County, Michigan.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1916: 5-52. *1 fig., 2 maps (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2310. ROGERS, R. F., AND L. A. WOLFANGER. **Soil survey of Chase County, Nebraska.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-64. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2311. SMIES, E. H. **Soil survey of Canadian County, Oklahoma.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-58. *1 fig., 1 map (colored).* 1919.—Canadian County, Oklahoma, is situated in the Great Plains region and consists of undulating to rolling uplands with a ruling elevation of 1375 feet above sea level. The area is thoroughly drained by four of the parallel streams that cross western Oklahoma in a southeastward direction.—Grain farming is the important industry of the county with the raising and fattening of livestock as the coördinate industry. The principal farm crops are corn, oats, wheat, grain sorghums, alfalfa, hay and cotton. Fruit growing is developed to some extent in part of the county. Railroad facilities are good.—The mean annual rainfall is about 32 inches. The highest rainfall occurs during the growing season while the winter months are comparatively dry. The lowest annual rainfall recorded is 17.27 inches. The mean annual temperature is 58.6°F. Hot, dry winds from the south sometimes cause considerable damage to crops.—The upland soils of the county are classed into two general divisions, residual prairie soils and soils largely of wind blown origin. The residual prairie soils are derived from the underlying red sandstones and shales, which form a part of the Permian Red Beds. They are usually calcareous. The wind blown soils are composed for the most part of material blown up over the uplands from the near-by alluvial flood plains. The alluvial bottom-land soils are divided into two general divisions, terrace or second-bottom soils, and the more recent alluvial or first-bottom soils.—The principal native grasses of the upland soils consisted chiefly of blue stem, buffalo grass, grama, mesquite and a variety of bunch grasses. Blue stem disappears after being pastured for a few years and the principal growth is mesquite. Timber belts lie along most of the drainage ways in the more rolling sections. The trees are chiefly elm, hackberry, black walnut, cottonwood and oak. Red cedar was once abundant.—The farms in the vicinity of the larger streams and on the prairie soils are fairly well improved.—*F. B. Howe.*

2312. Tartar, H. V., and F. C. Reimer. **The soils of Jackson County.** Oregon Agric. Exp. Sta. Bull. 164. *62 p. 1 map.* 1920.—An area of approximately 544 square miles of valley and adjacent hill and mountain land in the central part of Jackson County were studied. The soil types are numerous and fall principally into two classes, residual and alluvial, ranging from fine sandy loam to clay adobe. Results of chemical analyses of the most important soil types showed, that there is an abundant supply of potassium, calcium and magnesium, that none are acid, that the phosphorus supply is only fair to low, that the nitrogen content (also organic matter) is prevailingly low, and that sulfur is present in most of the soils in quantities so small that it is one of the limiting factors in the growth of crops making large demands for that plant food. Irrigation and drainage are needed in some places.—*E. J. Kraus.*

2313. Thorp, W. E., and H. J. Harper. **Soil survey of Blackhawk County, Iowa.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 7-43. *1 fig., 2 pl., 1 map (colored).* 1919.—For character report see Bot. Absts. 5, Entry 2316.

2314. Tillman, B. W., F. A. Hayes, and F. Z. Hutton. **Soil survey of Drew County, Arkansas.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-46. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2315. Tillman, B. W., and B. F. Hensel. **Soil survey of Phelps County, Nebraska.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-40. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2316. Tillman, B. W., and B. F. Hensel. **Soil survey of Wayne County, Nebraska.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-47. *1 fig., 1 map (colored).* 1919.—Situated in northeastern Nebraska, Wayne County covers about 450 square miles. The topography is uneven, ranging from hills to level areas. Three-fourths of the county is upland, one-eighth bottom land and the remainder terrace. The bottom areas lie at about 1500 feet above sea level, while the hills are 160 feet higher.—The climate is suited to general farming, with an annual precipitation of 28 inches and a mean annual temperature of 48°F. The growing season of 144 days receives about one-half of the annual rainfall.—The upland soils, comprising 76 per cent of the county, are loess of the *Marshall* and *Knox* series. The former is a black soil while the latter is light brown. Both are silt loams, and quite productive. The sedimentary soils, covering 17.5 per cent of the county are the most productive although the terrace areas, ranking with the loess in fertility, are excellent.—The main industry of the county is agriculture. The principal crops are corn, oats, alfalfa, clover, timothy, wheat and hay. Wheat is about the only cash crop. Over one-third of the crop acreage every year is corn. Stock raising is constantly receiving greater attention.—Progressive farmers follow systematic crop rotation. Drainage, especially on the bottom lands, is being rapidly developed. Good crops are obtained in all parts of the county although the production is below what it should be for soils of such high natural fertility. The cropping systems in vogue are not keeping up the productiveness of the land. More attention should be paid to green manures and legumes.—*H. O. Buckman.*

2317. Van Duyne, C., L. R. Schoenmann, and S. D. Averitt. **Soil survey of Shelby County, Kentucky.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1916: 5-64. *1 fig., 1 pl., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

2318. Van Duyne, C., W. E. McLendon, W. J. Latimer, and I. M. Morrison. **Soil survey of Marlboro County, South Carolina.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-72. *2 fig., 1 map (colored).* 1919.—Marlboro County occupies a belt in northeastern South Carolina extending from the crest of the Sandhill region down into the lower Coastal Plain. The elevations range from 140 to 300 feet. The area is in part undulating and in part flat and poorly drained. Drainage is into the Pee Dee River.—The winters

are short and mild while the summers are long and hot. Two-thirds of the 47 inches of rain fall during the summer months. The growing season is about 216 days. A great variety of crops may be grown.—Marlboro County is one of the best developed counties agriculturally of the state. Many different soil types occur, those of the coastal plain being extensively farmed and mostly to cotton. While the terrace soils along the Pee Dee River are cropped, the bottom lands yet remain to be developed. Corn, cowpeas, wheat and oats do well. Peanuts yield splendidly on all soils. The first bottoms are fine grass lands and offer splendid opportunities for cattle raising.—Crops are not very often grown in rotation and the land is running down. Constantly increasing amounts of fertilizer are necessary. Complete mixed fertilizers are most generally purchased. Some nitrate of soda is used as a top dressing. Lime although needed has not come into general use.—*H. O. Buckman.*

2319. WATKINS, W. I., E. D. FOWLER, H. I. COHN, J. A. MACKLIS, AND H. H. KRUSEKOPF. **Soil survey of Texas County, Missouri.** Advance sheets, Field Operations Bur. Soils, U. S. Dept. Agric. 1917: 5-36. *1 fig., 1 map (colored).* 1919.—For character of report see Bot. Absts. 5, Entry 2316.

MOISTURE RELATIONS

2320. HARDING, S. T. **Relation of the moisture equivalent of soils to the moisture properties under field conditions of irrigation.** Soil Sci. 8: 303-312. *6 fig.* 1919.—A comparison was made of the moisture equivalent with the critical moisture points of soils under actual field conditions of irrigation practice. The results include over 9000 individual moisture determinations and 136 determinations of moisture equivalent varying from 4.1 to 37.6. The maximum field capacity, the normal field capacity, soil moisture before irrigation, and soil moisture at permanent wilting of the crop were studied. Expressed as per cent of the moisture equivalent the moisture at the time of permanent wilting alone shows a linear relationship with the moisture equivalent. This for the surface foot is about 15 per cent less than that given by the formula of BRIGGS and SHANTZ.—*W. J. Robbins.*

2321. KNAPP, GEORGE S. **Winter irrigation for western Kansas.** Kansas Agric. Exp. Sta. Circ. 72. *8 p.* Jan., 1919.

METHODS

2322. BEAR, FIRMAN E., AND GEORGE M. MCCLURE. **Sampling soil plots.** Soil Sci. 9: 65-75. *4 fig.* 1920.—The composite from a one-twentieth acre plot should be made up of 20 samples, each 12 inches in depth and uniformly distributed over the plot.—*W. J. Robbins.*

2323. GARDNER, WILLARD. **A new soil elutriator.** Soil Sci. 9: 191-197. *2 fig. Pl. 1.* 1920.—An elutriator for the mechanical analysis of soil is described and figured.—*W. J. Robbins.*

2324. GILLESPIE, L. J. **Colorimetric determination of hydrogen-ion concentration without buffer mixtures, with especial reference to soils.** Soil Sci. 9: 115-136. *1 fig.* 1920.—A simple method is described for the colorimetric determination of the hydrogen-ion exponent without the use of buffer mixtures. The method also provides for the elimination of errors due to the turbidity of the solution in which the determination is made. Each color standard consists of two test tubes, one tube containing 5 cc. of dilute acid, the other 5 cc. of dilute alkali. The tubes together contain 10 drops of indicator solution, the 10 being divided between the alkaline and acid tubes in various "drop ratios." To 10 cc. of the unknown solution, 10 drops of the indicator solution are added and compared with the two color standards by means of a simple comparator. A table is given of the pH for each drop ratio of the indicators used which cover a range of P_H 3.1 to P_H 9.75. Soil extracts, water clear, were prepared by the use of colloidal iron solution as a precipitant and pH measurements of the water extracts of nine soils prepared by this method gave the same results as were obtained by the usual methods.—*W. J. Robbins.*

2325. Hurst, C. T., and J. E. Greaves. **Some factors influencing the quantitative determination of chlorides in soil.** Soil Sci. 9: 41-51. 1920.—A soil extract is obtained by filtering through a Pasteur-Chamberland filter or by the use of alum and the chlorides determined by the method given in detail.—*W. J. Robbins.*

2326. Robinson, R. H. **Concerning the effect of heat on the reaction between lime-water and acid soils.** Soil Sci. 9: 151-157. 1920.—The length of time of heating and the temperature used during the process of evaporation affects the lime requirement of acid soils as determined by the Veitch method. Variations in the lime requirement of a soil from 1300 pounds per acre when evaporation occurred in 2.5 hours at 70° to 4600 pounds per acre where evaporation occurred at 110° in 8 hours were found.—*W. J. Robbins.*

MISCELLANEOUS

2327. Call, L. E. **Director's report.** Kansas Agric. Exp. Sta. 1917-18. *63 p.* 1918.—See Bot. Absts. 5, Entries 1466, 2024.

2328. Jovino, S. **Osservazioni sull'aridocoltura italiana. [Observations upon dry farming in Italy.]** Stas. Sperim. Agrarie Italiane 52: 69-121. 125-192. 1919.—A lengthy study of the subject divided in the following way: (1) the climate of the arid regions of Italy, (2) the soil of the arid regions of Italy, (3) biological characteristics of Italian dry farming, (4) the function of fallowing in Italy, (5) the critical period in the spring, (6) the summer critical period, (7) means of favoring the evolution of the present cultural conditions. In this paper are studied the adaptations of plants to the conditions of the arid regions: low soil-water content, high temperature and strong illumination. A lengthy abstract of this paper with special emphasis on the technical side is to be found in Monthly Bull. Internation. Instit. Agric. Rome 10*: 522-526. 1919. (English edition.)—*A. Bonazzi.*

2329. Hodsoll, H. E. P. **The care of the soil.** Jour. Roy. Hortic Soc. 45: 22-28. 1919. —*J. K. Shaw.*

2330. Howard, A., and G. L. C. **Report of the Imperial Economic Botanists.** Sci. Rept. Agric. Res. Inst. Pusa 1918-19: 46-67. *Pl. 5 and 6.* 1919.—See Bot. Absts. 5, Entry 1159.

2331. Middleton, Howard E. **The moisture equivalent in relation to the mechanical analysis of soils.** Soil Sci. 9: 159-167. *1 fig.* 1920.—The maximum percentage of water which a soil can retain in opposition to a force equal to 1000 times that of gravity (the moisture equivalent) was compared with the mechanical analyses. The relation between the percentage of sand, silt and clay and the moisture equivalent was found to be 0.063 sand+0.291 silt+0.426 clay=moisture equivalent. The presence of considerable organic matter increases the moisture equivalent and disturbs the above relation.—*W. J. Robbins.*

2332. Powers, W. L. **Duty of water in irrigation.** Oregon Agric. Exp. Sta. Bull. 161. *80 p., 1 fig.* 1920.—Proper economical irrigation is necessary to permanent irrigative agriculture. By saving 50 per cent of the water now used in many places, it will be possible to double the crop producing area. The economical use and duty of irrigation water depend upon a wide variety of conditions of culture, method of distributing and handling of the water, types of crops produced, and environment. Soil fertility is one of the most important factors affecting irrigation requirements, for it is frequently possible to double the returns from each unit of water supplied by applying needed simple fertilizers. At times one ton of manure may equal 100 tons of water in securing returns. Irrigation farming reaches its highest development in connection with intensive farming. In general it is better economy to provide only a moderate allowance of water with reasonably priced structures than to provide a liberal supply at a great expense and invite additional drainage assessments later.—*E. J. Kraus.*

2333. POWERS, W. L., AND W. W. JOHNSTON. **The improvement and irrigation requirement of wild meadow and tule land.** Oregon Agric. Exp. Sta. Bull. 167. *44 p., 25 fig.* 1920.—See Bot. Abstr. 5, Entry 1198.

2334. WHERRY, EDGAR T. **Soil tests of Ericaceae and other reaction-sensitive families in northern Vermont and New Hampshire.** Rhodora 22: 33-49. 1920.

2335. WITTMACK, L. **Die Bonitierung des Bodens nach der Unkrautpflanzen. [The rating of soils according to the weeds growing on them.]** Illustrierte Landw. Zeitg. 39: 391-392. 1919.

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*
E. B. PAYSON, *Assistant Editor*

GENERAL

2336. ANONYMOUS. [Rev. of: WILLIAM MANSFIELD. **Squibb's atlas of the official drugs.** *686 p., illustrated.* 1919.] Druggists Circ. 63: 243. 1919.—See Bot. Abstr. 3, Entry 1691.

2337. B. D. **Quelques plantes nouvelles. [Some new plants.]** Rev. Hortic. [Paris] 91: 260-262. *Fig. 84-85.* Apr., 1919.

2338. BOLUS, HARRIET M. L. **Elementary lessons in systematic botany.** Based on familiar species of the South African Flora, with an introduction and eight summaries. Illustrated by MARY M. PAGE. *96 p., 24 fig.* 1919.

2339. BROWN, WILLIAM H., AND ARTHUR F. FISCHER. **Philippine mangrove swamps.** Bur. Forestry Dept. Agric. and Nat. Resources [Manila] Bull. 17. *132 p. Pl. 1-47.* 1918.—About 30 species are listed as mangrove-swamp plants in the Philippine Islands; these belong to 17 families. A key to the genera is given, the species are described and their local names recorded. The paper is copiously illustrated by reproductions from photographs.—*J. M. Greenman.*

2340. BUSWELL, W. M. **Familiar wildflowers of Florida.** Amer. Bot. 25: 90-93. 1919.

2341. CHEVALIER, AUG. **Catalogue des plantes du jardin botanique de Saigon. [Catalogue of plants in the Botanical Garden of Saigon.]** *68 p.* 1919.—The introductory matter includes an interesting historical sketch of the Botanical Garden. In appendix II is included a number of changes in nomenclature, the new binomials proposed being necessitated by the determination of the exact status of some of LOUREIRO's hitherto imperfectly known species. —*E. D. Merrill.*

2342. CREMATA, MERLINO. **Cercas, alambradas y setos en Cuba. [Fences and hedges in Cuba.]** Revist. Agric. Com. y Trab. 2: 259-272. *29 fig.* 1919.—See Bot. Abstr. 3, Entry 527.

2343. EWART, A. J. **Contributions to the flora of Australia. No. 26.** Proc. Roy. Soc. Victoria (N. S.) 30: 173-177. 1918.

2344. GERTZ, OTTO. **Christopher Rostii herbarium vivum. Ein deutsches herbar vom jahre 1610. [The herbarium of Christopher Rostius. A German herbarium of the year 1610.]** Oesterr. Bot. Zeitschr. 67: 369-382. 1918.—This collection consists of 363 specimens of plants, chiefly of central Europe and the Mediterranean region, mounted in a bound volume 20 x 16.5 cm. in size. The original author is unknown, but a history of the herbarium is in part recorded. A list of the original names accompanying the specimens is given with their present binomial equivalents.—*J. M. Greenman.*

2345. HALLIER, HANS. **Ueber Gaertner'sche Gattungen und Arten unsicherer Stellung, einige Rubiaceen, Sapotaceen, Cornaceen und über versunkene Querverbindungen der Tropenländer.** [Horticultural genera and species of uncertain position, some Rubiaceae, Sapotaceae, Cornaceae; submerged land-connections in the tropics.] Recueil Trav. Bot. Néerlandais 15: 27–122. 1918.

2346. HEMSLEY, W. B., AND OTHERS. **Flora of Aldabra: with notes on the flora of the neighboring islands.** Kew Bull. Misc. Inf. [London] 1919: 108–153. 1919.—See Bot. Absts. 4, Entry 339.

2347. KOPS, JAN, F. W. VAN EEDEN, AND L. VUYCK. **Flora Batava. Afbeelding en Beschrijving der Nederlandische Gewassen.** [Flora of Batavia. Illustrations and descriptions of plants of Holland.] Aflevering 396e-399e. *Pl. 1977–1992.* Martinus Nijhoff's, Gravenhage. 1919.—The present parts contain descriptions and colored illustrations of the following vascular plants: *Carex Kneuckeriana* Zahn, *Cyperus vegetus* Willd., *Glyceria plicata* Fr., *Veronica praecox*, All., *Solanum nitidibaccatum* Bitter, *Rubus humifusus* Weihe & Ness, *R. pyramidalis* Kaltenb., *R. cassius* var. *aqualicus* Weihe & Ness, *Rumex odontocarpus* Sandor, and *Lathyrus cicera* L. The non-vascular plants included are: *Hydnum violaceum* Thore, *H. nigrum* Fr., *Psathyrella disseminata* P., *Peziza hemisphaerica* Hoff., *Clavaria aurea* Schaeff., *Mycena epipterygia* Scop., *Amanita porphyria* Fr., and *Hygrophorus pratensis* Fr.—*J. M. Greenman.*

2348. LANE-POOLE, C. E. **Report of the Woods and Forests Department for the half-year ended 30th of June, 1918.** Semi-Ann. Progress Rept. Woods and Forests Dept. Western Australia. *17 p.* 1919.—See Bot. Absts. 4, Entry 443.

2349. MOLA, PASQUALE. **Flora delle acque Sarde. Contributo delle Piante idrofite ed igrofite della Sardegna.** [Flora of the Sardinian waters. Hydrophytes and hygrophytes of Sardinia.] Atti R. Accad. Sci. Torino 54: 478–502. 1918–1919.—See Bot. Absts. 4, Entry 1025.

2350. NELSON, JAMES C. **A comparison of the flora of southern British Columbia with that of the State of Washington, as illustrated by the floras of Henry and Piper.** [Rev. of: HENRY, JOSEPH KAYE. **Flora of Southern British Columbia and Vancouver Island.** *363 p.* W. J. Gage & Co.: Toronto, 1915.] Torreya 19: 174–184. 1919.—HENRY'S Flora, although covering a territory at least twice as large as the State of Washington, and extending to the eastward so as to include the Rocky Mountain flora, mentions only 2359 named forms as compared with 2511 in PIPER'S Flora of Washington. Of these 1517, or about 60 per cent, are common to both manuals. Assuming equal thoroughness on the part of both authors, two conclusions seem to be justified. (1) That Washington is a region of more marked endemism than British Columbia. (2) That the 49th parallel seems to come very near to a line marking the extreme northward dominance of the Californian flora on the one hand, and the extreme southern extension of the Alaskan flora on the other. In Henry's Flora there are 764 forms not mentioned by PIPER; in PIPER'S 928 not mentioned by Henry. These species are arranged by groups to show distribution and degree of endemism. A table of discrepancies in the case of 18 of the larger genera is presented. Prof. Henry displays a commendable conservatism in his conception of taxonomic relations. The book is marred by many inaccuracies in capitalization, grammatical agreement, orthography, abbreviation, citation and etymology, but on the whole is a valuable effort to contribute to the fuller knowledge of the Northwest Flora. —*J. C. Nelson.*

2351. PHILLIPS, EDWIN PERCY. **Some notes on a collecting trip to French Hoek.** South African Jour. Sci. 15: 450–478. 1919.—See Bot. Absts. 4, Entry 298.

2352. QUER, P. FONT. **Plantas de Tetuán.** [Plants of Tetuán.] Bol. R. Soc. Española Hist. Nat. 19: 93–95. 1919.—List of eighty-four species of plants collected in the vicinity of Tetuan, northern Morocco, by Manual Pando in April, 1916. Proposed as new are *Cistus*

saleifolius var. *Pandoanus*, *Linum strictum* a *cymosum* f. *scaberrimum*, *Trifolium campestre* var. *Pandoi*, *Cerinthe orancnsis* f. *parviflora*. New combinations appear to be *Lathyrus Clymenium* race *articulatus* (L.), and *Convolvulus tricolor* race *pseudotricolor* (Bert.).—*O. E. Jennings.*

2353. QUER, P. FONT. **Adiciones a la flora de Menorca.** [**Additions to the flora of Minorca.**] Bol. R. Soc. Espanola Hist. Nat. 19: 268-273. 1919.—This is an annotated list with localities and other information relating to 69 species, varieties, or forms. Former workers on this flora are referred to and the following new species or varieties are published: *Fumaria muralis* Sond. var. *longipes* Pau, *Calycotome spinosa* Link race *villosa* Link var. *Fontquerí* Pau, *Lotus fallax* Quer, *Cotyledon umbilicus* L. var. *minoricensis* Pau, and *Avellinia Michelii* Parl. var. *longiaristata* Quer. Nine of these plants are new to the flora of the Balearic Islands.—*O. E. Jennings.*

2354. SALISBURY, F. S. **Naturalized plants of Albany and Bathurst.** Rec. Albany Mus. [Grahamstown, South Africa] 3: 161-177. 1919.

2355. STONE, HERBERT. **Les bois utiles de la Guyane Française.** [**The useful woods of French Guiana.**] Ann. Mus. Colonial, Marseille III, 6: 1-68. 1918.—The present article continues the author's enumeration of the useful woods of French Guiana and includes well known species of the following families: Combretaceae, Myrtaceae, Melastomaceae, Samydaceae, Passifloraceae, Araliaceae, Rubiaceae, Sapotaceae, Ebenaceae, Styricaceae, Oleaceae, Apocynaceae, Borraginaceae, Bignoniaceae, Myoporaceae, Verbenaceae, and Polygonaceae.—*J. M. Greenman.*

2356. TURRILL, W. B. **Contributions to the flora of Macedonia.** Kew Bull. Misc. Inf. [London] 1919: 105-108. 1919.—See Bot. Absts. 4, Entry 368.

2357. VUIJK, L. **Verslag der excursie gehouden te 's-Hertogenbosch 26 Juli 1918 en volgende dagen.** [**Report of the excursion held in Hertogenbosch, Holland, etc.**] Nederland. Kruidkundig Arch. 1918: 19-30. May, 1919.—A rather complete enumeration of the plants found by the members of the society on the trip. A six page list with additions to the flora is given. —*J. A. Nieuwland.*

2358. WABY, J. F. **Notes on a collection of preserved fruits and seeds (Part 1).** Jour. Bd. Agric. British Guiana 12: 2-6. 1919.—Descriptions of a very large collection of tropical fruits and seeds preserved in glass jars in the Herbarium of the Botanic Garden of Georgetown. In this part are given descriptions of plants, flowers, fruits and seeds of *Entada scandens*, *E. polystachya*, *Poinciana regia*, *Cassia grandis*, *C. fistula*, *C. javanica*, *Pterocarpus guianensis*, and *Platymiscium polystachyum*.—*J. B. Rorer.*

2359. WABY, J. F. **Notes on a collection of dried fruit and seeds** (continued). Jour. Bd. Agric. British Guiana 12: 102-111. 1919.—Descriptions of seeds and fruits, together with common names, many interesting notes and superstitions, of the following plants: *Eperua falcata*, *E. Schomburghii*, *E. Jenmani*, *Bauhinia Vahlii*, *Enterolobium cyclocarpum*, *E. Timbouva*, *Caesalpinia Bonducella*, *Macrolobium acaciaefolium*, *M. hymaenoides*, *Caesalpinia Sappan*, *Peltophoroum ferrugineum*, *Caesalpinia bijuga*, *C. ferica*, *C. coriaria*, *Piscidia Erythrina*, *Acacia arabica*, *Detarium senegalense*, *Flemingia strobilifera*, *Drepanocarpus lunatus*, *Ormosia dasycarpa*, *O. jamaicensis*, *Copaifera officinalis*, *Myrospermum Pereirae*, *Mucuna urens*, *M. pruriens*, *M. Fawcettii*. *Stizolobium altissimum*, *Adenanthera Pavonina*, *Erythrina corallo dendron*, *E. indica*, *Psophocarpus tetraagonolobus*, and *Trachylobium Hornemannianum*.—*J. B. Rorer.*

2360. WILLIAMS, FREDERIC N. **Pulteney's references to the Flora Londinensis.** Jour. Botany 57: 100. 1919.—Notes on the so-called "MS. of Pulteney," and on the confusion of plates, and chronological puzzles in the above flora.—*K. M. Wiegand.*

PTERIDOPHYTES

2361. BARNOLA, JOAQUIN MA. DE. **Las Licopodiales de la península Ibérica, citas y notas críticas.** [Catalogue of Iberian Lycopodiales.] Broteria Ser. Bot. 17: 17-27. 1919.—The author lists the species and varieties of *Lycopodium*, *Selaginella*, and *Isoetes* which grow in Spain or Portugal, with keys, detailed citation of localities, some critical notes on distribution, and a bibliography of 22 titles; no new forms are described.—*Edward B. Chamberlain.*

2362. BECK, G. **Einige Bemerkungen über heimische Farne.** [Some observations on native ferns.] Oesterr. Bot. Zeitschr. 67: 52-63, 113-123. 1918.—The author gives an annotated list of ferns of south-central Europe and records particularly the spore characters of several species and forms.—*J. M. Greenman.*

2363. BENEDICT, R. C. **The simplest fern in existence.** Amer. Fern Jour. 9: 48-50. *Pl. 3, 7 fig.* 1919.

2364. GRAVES, E. W. **The Botrychiums of Mobile County, Alabama.** Amer. Fern Jour. 9: 56-58. 1919.—*Botrychium obliquum*, *B. biternatum* (Lam.) Underw. and *B. alabamense* Maxon are found growing together in this county. *B. alabamense* may be distinguished from *B. biternatum* by the manner in which it holds its sterile fronds and also by the time of fruiting. The former holds its sterile fronds three to ten inches above the ground and completes fruiting by October 15, while the latter holds its sterile fronds not more than an inch above the ground and matures its fruit about March 1.—*F. C. Anderson.*

2365. MAXON, WILLIAM R. **Ferns of the District of Columbia.** Amer. Fern Jour. 9: 38-48. 1919.—After briefly describing the area adopted for the "District flora," the author lists 56 species, distributed among 25 genera. The occurrence and habitat of each species is discussed.—*F. C. Anderson.*

2366. PALMER, ERNEST J. **Texas Pteridophyta—II.** Amer. Fern Jour. 9: 50-56. 1919.—The author continues the enumeration of the Pteridophytes of Texas, listing 17 species with habitat and localities. A reduced form of *Botrychium obliquum* Muhl. may represent a distinct and undescribed variety.—*F. C. Anderson.*

2367. WEATHERBY, C. A. **Changes in the nomenclature of the Gray's Manual ferns.** Rhodora 21: 173-179. 1919.—A discussion of the changes which have been accepted in the nomenclature of the *Polypodiaceae* and the *Osmundaceae* of Gray's Manual since the publication of the seventh edition and an explanation of these changes. The summary gives a list of thirty changes, in each case giving the Manual name, the later name and authority, and the synonyms.—*James P. Poole.*

2368. WOYNAR, H. **Betrachtungen über Polypodium austriacum Jacquin.** [Considerations on Polypodium austriacum Jacquin.] Oesterr. Bot. Zeitschr. 67: 267-275. 1918.—The author presents a discussion of this fern particularly with reference to the nomenclatorial status of the specific name.—*J. M. Greenman.*

SPERMATOPHYTES

2369. BERINGER, G. M. [Rev. of: MAIDEN, J. H. **A critical revision of the genus Eucalyptus.** Vol. IV, Part 6. Published by the Government of the State of New South Wales.] Amer. Jour. Pharm. 91: 328-329. 1919.—*Anton Hogstad, Jr.*

2370. BLAKE, S. F. **The genus Homalium in America.** Contrib. U. S. Nation. Herb. 20: 221-235. 1919.—Nineteen species are recognized, in addition to one doubtful one (*H. senarium* Moc. & Sessé). The following are new: *H. nicaraguense*, *H. mollicellum*, *H. pleiandrum*. *H. leiogynum*, *H. hemisystylum*, *H. racemosum* subsp. *barbellatum*, *H. Pittieri*, *H. trichocladum*, *H. eleutherostylum*, *H. columbianum*, *H. stenosepalum*, *H. eurypetalum*.—*S. F. Blake.*

2371. BLAKE, S. F. **New South American spermatophytes collected by H. M. Curran.** Contrib. U. S. Nation. Herb. 20: 237–245. 1919.—The following new species and new names occur: *Dorstenia anthuriifolia*, *Caussapoa Curranii*, *Coccoloba cyclophylla*, *Ruprechtia oxyphylla*, *R. coriacea* (Karst.) Blake, *Triplaris euryphylla*, *T. lara*, *Schizolobium parahybum* (Vell.) Blake, *Guarea racemiformis*, *Trichilia alta*, *T. Curranii*, *T. microdonta*, *T. triphylla*, *Fischeria blepharopetala*, *Macroscepis barbata*.—*S. F. Blake.*

2372. BLOM, CARL. **Lepidium bonariense L., Lepidium neglectum Thell., samt Rumex salicifolius L. funna i Sverge.** Bot. Notiser 1919: 181. 1919.—The first and the last of these are recorded from ballast at Malmö, and the second one from Borås and Stockholm.—*P. A. Rydberg.*

2373. CHEVALIER, A. **Quelques légumineuses d'Extreme-Orient utiles à répandre.** [Some legumes of Indo-China worthy of wider use.] Bull. Agric. Inst. Sci. Saigon 1: 87–92. 1919. Contains the new combination *Mucuna cochinchinensis* (Lour.) A. Chev. based on *Marcanthus cochinchinensis* Lour., the oldest valid name for *Mucuna nivea* W. & A.—*E. D. Merrill.*

2374. CHEVALIER, A. **Le pommier à cidre des hauts plateaux de l'Indochine.** [The cider apple of the high plateaus of Indo-China.] Bull. Agric. Inst. Sci. Saigon 1: 142–150. 1919. The utilization of the fruits of *Pyrus Doumeri* Bois is discussed and the species redescribed. —*E. D. Merrill.*

2375. CHEVALIER, A. **Une nouvelle variété de palmier Elaeis.** [A new variety of the Elaeis palm.] Bull. Agric. Inst. Sci. Saigon 1: 154, 155. 1919.—Reduces *Elaeis Poissoni* Annet to *E. guineensis* Aubl. as var. *Poissoni* (Annet) A. Chev.—*E. D. Merrill.*

2376. CLUTE, WILLARD N. **Phlox nomenclature.** Amer. Bot. 25: 100, 101. *Fig. 1.* 1919. —Eastern and western forms of *Phlox divaricata* appear to differ in the shape and size of the flowers. The differences were noted long ago by ALPHONSO WOOD who called the western variety, *Laphamii*. The differences in the two forms have been ignored by systematists but it is suggested that the western form be called *Phlox Laphamii* (Wood).—*W. N. Clute.*

2377. CREMATA, MERLINO. **Plantas meliferas.** [Melliferous plants.] Revist. Agric. Com. y Trab. 2: 140–152. *10 fig.* 1919.—See Bot. Absts. 4, Entry 215.

2378. DE CANDOLLE, CASIMIR. **Begoniaceae Centrali-Americanae et Ecuadorenses.** [Begoniaceae of Central America and Ecuador.] Smithsonian Misc. Collections 68[12]: 1–10. 1919. —The following new species and new names appear, with Latin descriptions: *Begonia Kellermanii* (Guatemala), *B. fissurarum* (*B. leptophylla* C.DC. 1908, not Taub. 1896), *B. stenoptera* (Costa Rica), *B. garagarana*, *B. brevicyma*, *B. mucronistipula*, *B. uvana*, *B. mameiana*, *B. villipetiola*, *B. cilibracteola*, *B. leptopoda*, *B. pubipedicella*, *B. serratifolia*, *B. chiriquina*, *B. chepoensis*, *B. caudilimba*, *B. udisilvestris*, *B. parcifolia* (Ecuador). With the exceptions noted, all these are described from Panama.—*S. F. Blake.*

2379. FERNALD, M. L. **I. The unity of the genus Arenaria. II. The type of the genus Alsine. III. The earlier names for Alsinopsis. IV. The American representatives of Arenaria sajanensis. V. The specific identity of Arenaria groenlandica and A. glabra. VI. The American variations of Arenaria verna** [Contrib. Gray Herb. Harvard Univ. New Series.—No. LVII]. Rhodora 21: 1–22. 1919.—The subject-matter under the six separate titles deals with the genus *Arenaria* which the author maintains in its broad sense. The following new combinations, new names, and new species are published: *Arenaria arenarioides* (*Cerastium arenarioides* Crantz), *A. bryophylla* (*Ar. musciformis* Edgew. & Hook. f., not Triana & Planch.), *A. Funkii* (*Alsine Funkii* Jord.), *A. cymifera* (*Alsine cymifera* Rouy & Foue.), *A. iberica* (*Minuartia dichotoma* L., not *Ar. dichotoma* Krock), *A. caucasica* (*Alsine caucasica* Boiss.), *A. anatolica* (*Alsine anatolica* Boiss.), *A. Thevenaei* (*Alsine Thevenaei* Reut.), *A. attica* (*Alsine attica* Boiss.), *A. sphagnoides* (*Sabulina sphagnoides* Froel.), *A. aizoides* (*Alsine aizoides* Boiss.),

A. decipiens (*Alsine decipiens* Fenzl), *A. dianthifolia* (*Alsine dianthifolia* Boiss.), *A. intermedia* (*Alsine intermedia* Boiss.), *A. leucocephala* (*Alsine leucocephala* Boiss.), *A. pulvinaris* (*Alsine pulvinaris* Boiss.), *A. makmelensis* (*Alsine libanotica* Boiss., not *Ar. libanotica* Kotschy), *A. rimarum* (*Alsine rimarum* Boiss. & Balansa), *A. Schimperii* (*Alsine Schimperii* Hochst.), *A. stellata* (*Cherleria stellata* Clarke), *A. diversifolia* (*Moehringia diversifolia* Dolliner), *A. Grisebachii* (*Moehringia Grisebachii* Janka), *A. Jankae* (*Moehringia Jankae* Griseb.), *A. dasyphylla* (*Moehringia dasyphylla* Bruno), *A. dasyphylla* var. *sedoides* (*Moehringia mucosa* β *sedoides* Cumino), *A. Tommasinii* (*Moehringia Tommasinii* Marches), *A. glaucovirens* (*Moehringia glaucovirens* Bertol.), *A. polygonoides* Wulf. var. *obtusa* (*A. obtusa* All.), *A. papulosa* (*Moehringia papulosa* Bertol.), *A. platysperma* (*Moehringia platysperma* Maxim.), *A. Cossoniana* (*Moehringia stellarioides* Coss., not *Ar. stellarioides* Willd.), *A. octandra* (*Cherleria octandra* Sieb.), *A. obtusiloba* (*Alsinopsis obtusiloba* Rydb.), *A. marcescens*, *A. groenlandica* (Retz.) Spreng. var. *glabra* (*A. glabra* Michx.), *A. verna* L. var. *pubescens* (*A. hirta* β *pubescens* Cham. & Schlecht.), and *A. verna* var. *pubescens* forma *epilis* (*A. verna* var. *propinqua* forma *epila* Fernald).—*James P. Poole.*

2380. GIROLA, CARLOS D. **Maices argentinos y aclimatados: Variedades de Maíz cultivadis en Argentina.** *169 p. 35 pl.* Buenos Aires. 1919.—See Bot. Absts. 4, Entry 71.

2381. GLEASON, HENRY ALLAN. **Taxonomic studies in Vernonia and related genera.** Bull. Torrey Bot. Club 46: 235–252. 1919.—The following species and varieties of *Vernonia* are discussed: *V. borinquensis* Urban, *V. borinquensis* var. *Stahlii* Urban, *V. sericea* L. C. Rich., *V. gnaphaliifolia* Rich., *V. icosantha* DC., *V. racemosa* Delp., *V. rigida* Sw., *V. mollis* HBK., *V. missurica* Raf., *V. altissima* var. *pubescens* (Morris) Daniels. Descriptions of new species appear as follows: *V. Shaferi*, *V. morelana*, *V. salamana*, *V. ctenophora*, *V. aborigina*, *V. jucunda*. The following new varieties are given: *V. borinquensis* var. *resinosa*, *V. borinquensis* var. *hirsuta*, *V. gnaphaliifolia* var. *platyphylla*, *V. Sagraeana* var. *angusticeps* (Ekman), *V. missurica* var. *austroriparia*, *V. fasciculata* var. *nebraskensis*, *V. altissima* var. *brevipappa*, *V. altissima* var. *laxa*, *V. flaccidifolia* var. *angustifolia*, and *V. ovalifolia* var. *purpurea*. A new genus **Ekmania** is created for *E. lepidota* (Griseb.); *Vernonia Milleri* Johnston is referred to the genus *Oliganthes*; and *Piptocoma rufescens* var. *latifolia* and *Elephantopus elatus* var. *intermedius* are described as new varieties.—*P. A. Munz.*

2382. GOURLAY, W. BALFOUR, AND C. M. VEVERS. **Vaccinium intermedium Ruthe.** Jour. Botany 57: 259–260. 1919.—See Bot. Absts. 3, Entry 2128.

2383. LORENZ, ANNIE. **Nardus stricta in the White Mountains.** Rhodora 21: 22–23. 1919.—Reporting new station for *Nardus stricta* at Waterville, New Hampshire. Description of habitat and list of stations in U. S. A. previously reported.—*James P. Poole.*

2384. MATOUSCHEK. [Rev. of: HOLMBERG, O. **Orobanche caryophyllacea Sm. tagen i Sverige. (Orobanche caryophyllacea in Schweden entdeckt.) (Orobanche caryophyllacea discovered in Sweden.)** Bot. Notiser 1917: 193–195. *1 fig.* 1917.] Zeitschr. Pflanzenkrankh. 29: 59. 1919.

2385. MILLER, W. DEW. **A distinction between two Carices.** Rhodora 21: 23–24. 1919.—An additional character distinguishing *Carex laxiculmnis* Schweinitz and *C. digitalis* Willd. One to three staminate flowers at the base in most of the pistillate spikes of the former, but in the latter all staminate flowers are at the tip of the spike.—*James P. Poole.*

2386. NAKAI, TAKENOSHIN. **Genus novum Oleacearum in Corea media inventum. [New genus of the Oleaceae found in central Corea.]** Bot. Mag. Tôkyô 33: 153–154. 1919.—Latin diagnoses of the new genus **Abeliophyllum** Nakai and the new species *Abeliophyllum distichum* Nakai.—*L. L. Burlingame.*

2387. NELSON, JAMES C. **The grasses of Salem, Oregon, and vicinity.** Torreya 19: 216–227. 1919.—See Bot. Absts. 4, Entry 357.

2388. [Nordstedt, C. F. O.] [Swedish rev. of: Almquist. **Sveriges Rosae. (Swedish roses.)** *50 p.*, 1919.] Bot. Notiser 1919: 168. 1919.—*P. A. Rydberg.*

2389. [Nordstedt, C. F. O.] [Swedish rev. of: Jörgensen, E. **Die Euphrasia-Arten Norwegens. (The species of Euphrasia of Norway.)** Bergens Mus. Aarsbok, 1916-1917. *337 p., 11 maps, 14 pl., 54 fig.*] Bot. Notiser 1919: 182. 1919.—*P. A. Rydberg.*

2390. Pennell, Francis W. **A brief conspectus of the species of Kneiffia with the characterization of a new allied genus.** Bull. Torrey Bot. Club 46: 363-373. 1919.—A key is presented for the species of *Kneiffia* with descriptions of the following new species: *K. sessilis*, *K. brevistipata*, *K. semiglandulosa*, and *K. velutina*. The following new combinations are made: *K. fruticosa humifusa* (Allen), *K. tetragona* (Roth), *K. tetragona hybrida* (Michx.), and *K. perennis* (L.); while *K. tetragona* var. *longistipata* is offered as a new variety. A new allied genus **Peniophyllum** is made for *P. linifolium* (Nutt.) Pennell, comb. nov.—*P. A. Munz.*

2391. Pennell, Francis W. **Scrophulariaceae of the local flora. I.** Torreya 19: 107-119. 1919.—The area concerned is that included within the local flora range of the Torrey Botanical Club and the Philadelphia Botanical Club. The author has personally collected material of each species and made descriptions of fresh corollas. The object of the study is (1) to present detailed keys to the genera and species included in our flora, (2) to confirm the nomenclature, by stating the type-species and tracing the later history, (3) to give preliminary observations on distribution. Detailed keys for the entire family are presented, representing 8 tribes and 21 genera. The genera and species are then taken up in detail; the present installment discusses the tribes *Verbasceae* and *Chelonae*, including the genera *Verbascum* (4 species), *Pentstemon* (5 species), *Chelone* (1 species), and *Scrophularia* (2 species). One new combination is proposed, *Chelone glabra* L. forma *tomentosa* (Raf.) Pennell. The study will be continued.—*J. C. Nelson.*

2392. Pennell, Francis W. **Scrophulariaceae of the local flora, III.** Torreya 19: 161-171. 1919.—This installment takes up the tribe *Digitaleae*, containing the genera *Veronicastrum* (1 species) and *Veronica* (15 species, 1 variety). A detailed key to the species of *Veronica* is presented. Two new species are described: *Veronica Brittonii* Porter, Columbia University, the type from Marble Hill, Phillipsburg, New Jersey; and *V. glandifera* Pennell, from Suffolk, Nansemond County, Virginia. One new combination is made: *Veronica xalapensis* HBK. is reduced to a variety of *V. peregrina* L. *V. humifusa* Dickson of Gray's Manual, Ed. 7, is identified with *V. ruderalis* Vahl.—*J. C. Nelson.*

2393. Pennell, Francis W. **Scrophulariaceae of the local flora. IV.** Torreya 19: 205-216. 1919.—This installment takes up the tribe *Buchnereae*, containing the genera *Aureolaria* (4 species, 2 varieties), *Agalinis* (8 species) and *Otophylla* (1 species). One new variety is described, namely, *Aureolaria pedicularia* (L.) Raf. var. *intercedens*, collected at Mt. Arlington, Morris Co., New Jersey by K. K. Mackenzie, Aug. 26, 1906. Detailed notes on synonymy and distribution are continued.—*J. C. Nelson.*

2394. Rogers, R. S. **Chiloglottis Pescottiana sp. nov.** Proc. Roy. Soc. Victoria (N. S.) 30¹: 139-141. *Pl. 25.* 1918. [Contains papers read Sept. to Dec. 1917.] A description of this new species from specimens from Tallangatta, Victoria, is given. This is accompanied by an analytical table presenting data which differentiate this species from the six other Australian members of the genus.—*Eloise Gerry.*

2395. Rolfe, R. A. **The true mahogonies.** Kew Bull. Misc. Inf. [London] 1919: 201-207. 1919.—See Bot. Abstr. 3, Entry 2050.

2396. Salmon, C. E. **A hybrid Stachys.** Jour. Linnean Soc. Bot. London 44: 357-362. *1 fig.* 1919.—An account of the natural origin in a garden of a hybrid between *Stachys germanica* and *S. alpina*. The mistaken identity of this plant with Aiton's *S. intermedia* of North

America is discussed. This hybrid apparently arises frequently in European gardens, occurring in somewhat varying forms. The puzzling synonymy of this plant is worked out, and the characteristics of the hybrid and its parents tabulated in detail. [See Bot. Absts. 3, Entry 2188.]—*A. J. Eames.*

2397. Small, James. **The origin and development of the Compositae.** New Phytol. 18: 65–89. *Fig. 41–55.* 1919.

2398. Standley, Paul C. **Studies of tropical American phanerogams.—No. 3. Contrib.** U. S. Nat. Herb. 20.: 173–220. 1919.—This paper contains revisions of the Mexican species of *Ateleia*, the Mexican and Central American species of *Erythrina*, and the Panamanian species of *Leiphaimos*, together with descriptions of many new species of woody plants, chiefly Leguminosae and Rubiaceae. The following new names appear: *Ateleia Arsenii, A. insularis, Erythrina cochleata, E. montana* Rose & Standl., *E. occidentalis, E. Goldmanii, Capparis discolor, Forchammeria macrocarpa, F. lanceolata, Steriphoma macrantha, Acacia polypodioides, A. leucothrix, A. laevis, A. penicillata, A. Conzattii, A. sororia, A. Rosei, A. vernicosa, Calliandra Conzattii, Leucaena cuspidata, L. plurijuga, Pithecolobium leiocalyx, P. calostachys, P. macrosiphon, P. confine, Calophyllum Rekoi, C. chiapense, Maba nicaraguensis, M. Rekoi, Diospyros oaxacana, Leiphaimos truncatus, L. stellatus, L. Pittieri, L. albus, L. thalesioides, L. pulcherrimus, L. simplex* (Griseb.) Standl., *Randia cinerea* (Fernald) Standl., *R. lasiantha* (*Basanacantha lasiantha* Standl.). *R. Pittieri* (*B. Pittieri* Standl.), *R. portoricensis* (Urban) Standl., *R. spinifex* (Roem. & Schult.) Standl., *R. subcordata* (*Basanacantha subcordata* Standl.), *R. calycosa, R. laevigata, R. pleiomeris, R. guatamalensis, R. malacocarpa, R. Rosei, Hoffmannia rotundata, H. uniflora, H. panamensis, H. Tonduzii, H. orizabensis, H. decurrens, H. confertiflora, H. angustifolia, H. chiapensis, Hamelia costaricensis, H. panamensis, Casasia jacquinioides* (Griseb.) Standl., *Durvoia costaricensis, Phialanthus macrostemon, Machaonia Coulteri* (Hook. f.) Standl., *Chiococca pubescens, Guettarda Deamii, G. filipes, Brosimum Conzattii, Coussapoa Rekoi, Struthanthus densiflorus* (Benth.) Standl., *S. diversifolius* (Benth.) Standl., *S. Grahami* (Benth.) Standl., *S. Haenkeanus* (Presl) Standl., *S. Hartwegi* (Benth.) Standl., *S. inconspicuus* (Benth.) Standl., *S. inornus* (Robins. & Greenm.) Standl., *Phrygilanthus sonorae* (S. Wats.) Standl., *Ximenia pubescens, Platanus chiapensis, P. oaxacana, Prunus prionophylla, Caesalpinia acapulcensis, C. caladenia, C. sclerocarpa, Cassia chiapensis, C. Tonduzii, Indigofera sphinctosperma, Cracca Brandegei, C. lepicana, Andira Galeottiana, Picramnia pistaciaefolia* Blake & Standl., *Rhus Barclayi* (Hemsl.) Standl., *R. jaliscana, Maregravia guatemalensis.—S. F. Blake.*

2399. Taylor, Norman. **Rock's Lobelioideae of Hawaii.** [Rev. of: Rock, J. F. **A monographic study of the Hawaiian species of the tribe Lobelioideae, family Campanulaceae.** *594 p. 217 pl.*. Honolulu, Feb. 20, 1919.] Torreya 19: 228–230. 1919.—The flora of the Hawaiian Islands has been long noted for its extreme endemism. The tribe *Lobelioideae*, synonymous with the family Lobeliaceae, is discussed with reference to its affinities with its nearest relatives. The genus *Cyanea* is regarded as still in process of evolution. Seven genera, containing 149 species and varieties, are included. Four of the endemic genera are related to American genera. The species are fully described and illustrated. The book is truly a monograph in the best sense of the word.—*J. C. Nelson.*

2400. Waby, J. F. **Some interesting species of palms.** Jour. Bd. Agric. British Guiana 12: 49–55. 1919.—Descriptions of *Oreodoxa regia, O. regia* var. *Jenmanii, O. oleracea, Euterpe edulis, E. stenophylla, E. ventricosa, E. acuminata, E. Jenmanii*, and *E. utilis.—J. B. Rorer.*

2401. Waby, J. F. **Some interesting species of palms.** Jour. Bd. Agric. British Guiana 12: 112–115. 1919.—Gives descriptions, common names and interesting facts about the following palms—*Mauritia flexuosa, Chrysalidocarpus lutescens, Cystostachys renda, Desmoncus* sp., *Nipa fruticans*, and *Hyphaene thebaica.—J. B. Rorer.*

2402. Ward, Martha E. **Galax aphylla introduced in Massachusetts.** Rhodora 21: 24. 1919.—Few plants of *Galax aphylla* found in the woods in Swampscott, Mass., where previously reported by Fernald.—*James P. Poole.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. LIVINGSTON, *Editor*

2403. ANONYMOUS. **Sea-grass fibre as a packing material.** Sci. Amer. Monthly 1: 96. 1920. [Abstract from La Nature, Oct. 11, 1919, in Technical Rev.]

2404. ANONYMOUS. **Substitutes for pollen and nectar.** Agric. Gaz. New South Wales 31: 116. 1920.—Discusses rye flour as a substitute for pollen and nectar as food for bees.—*L. R. Waldron.*

2405. ANONYMOUS. **Putting flax on a modern basis.** Sci. Amer. 122: 166, 175-176. *4 fig.* 1920.—Pertains to manufacturing processes.—*Chas. H. Otis.*

2406. BOYER, G. **Sur l'inclusion de brins d'herbes par les champignons.** [Concerning the inclusion of bits of plants by certain fungi.] Actes Soc. Linn. Bordeaux (Proces-verbaux) 69: 49-50. 1915-16.—Stems and leaves of grasses remain living after their inclusion by growth of polyporous fungi.—*W. H. Emig.*

2407. CARDOT, J. **A letter from M. Cardot to the Sullivant Moss Society.** Bryologist 23: 7. 1920.

2408. CHALMERS, ALBERT J. **Sadd dermatitis.** Jour. Tropical Med. and Hygiene 23: 57-59. *7 fig.* 1920.—The stiff hairs of *Panicum pyramidale* Lam., one of the chief grasses forming the floating and rooted masses of vegetation which sometimes block the White Nile, are shown to cause a dermatitis in human beings, by their mechanical action.—*E. A. Bessey.*

2409. CHEEL, E., AND DUCKWORTH, A. C. **The cultivation of native plants.** Australian Nat. 4: 131-133. 1920.

2410. CLAUDY, C. H. **The fruits of scientific farming.** Sci. Amer. 122: 216. 1920.—A popular article on some of the activities of the United States Department of Agriculture.—*Chas. H. Otis.*

2411. DEBORD, GEO. G. **Comments on the examination of canned salmon.** [Abstract.] Absts. Bact. 4: 11. 1920.—Twelve hundred and eighty-three cans were examined bacteriologically of which 34 per cent were not sterile. The organisms found were aerobic, sporulating bacteria. There was no correlation between the sterility and the odor of the can. [From author's abst. of paper read at scientific session, soc. Amer. Bact.]—*D. Reddick.*

2412. DODD, SYDNEY. **Infestation of the skin, etc., of sheep by grass seeds.** Jour. Comparative Path. and Therap. 22: 90-95. 1919.—In many parts of Australia much injury, sometimes death, results in sheep from the penetration of the skin or eyes by seeds of various grasses, chiefly of the genera *Stipa* and *Aristida* and also *Hordeum murinum*, *Festuca bromoides* and possibly species of *Andropogon*.—*E. A. Bessey.*

2413. DUNHAM, ELIZABETH M. **Mounting mosses for exhibition purposes.** Bryologist 23: 6. 1920.—The author describes how specimens may be mounted on cardboard and protected against dust and breakage by sheets of celluloid.—*E. B. Chamberlain.*

2414. EDMONDSON, RUTH B., GEO. G. DEBORD, AND CHARLES THOM. **Botulism from canned ripe olives.** [Abstract.] Absts. Bact. 4: 10. 1920.—All cans which were swelled or "off" in odor showed living organisms. Twenty-seven cans from a "batch" which had caused poisoning cases were tested for *B. botulinus* and the organism was isolated from 7 cans. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2415. ESTY, J. R., AND C. C. WILLIAMS. **Resistant bacteria causing spoilage in canned foods.** [Abstract.] Absts. Bact. 4: 11. 1920.—The organisms causing this spoilage were facultative and obligate anaerobes and were classified according to the range in temperature

where growth occurred. The facultative anaerobes fell between (1) 42° and 80°C.; (2) 22° and 80°C.; (3) 37° and 80°C.; (4) 22° and 55°C.; (5) 37° and 55°C.; (6) 37° and 65°C.; (7) 22° and 45°C. All the five obligate anaerobes isolated were vigorous gas formers and fell into four groups according to the above classification. (1) 45° and 80°C.; (2) 30° and 65°C.; (3) 42° and 65°C.; (4) 22° and 45°C. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2416. HAMMER, B. W., AND L. R. SANDERS. **A bacteriological study of the method of pasteurizing and homogenizing the ice cream mix.** Iowa Agric. Exp. Sta. Bull. 186: 19–26. 1919.

2417. KING, ALBERT E. W. **The mechanical properties of Philippine bast-fiber ropes.** Philippine Jour. Sci. 14: 561–655. *5 pl., 2 fig.* 1919.—These investigations were undertaken to secure quantitative results on the mechanical properties of Philippine bast-fiber ropes. Thirty-two kinds of fibrous material were obtained from bast-plant species, and seven from those that gave no bast-fibers. These were compared with abaca and maguey. The plain stripping process of obtaining fiber was compared with the water-retting process, to the advantage of the latter. The circumference and cross sectional area were calculated and the tensile strength was determined, the results being collected in a series of tables. The individual species of the fiber plants are described.—*Albert R. Sweetser.*

2418. MAGGIORA, A., AND CARRONE, D. **Sull'impiego del Bacillus felsineus per la macerazione industriale della canapa. [The utilization of B. felsineus in the retting of hemp on an industrial scale.]** Staz. Sper. Agrarie Ital. 52: 449–462. 1919.—The present investigation aims at the study of the commercial application of a biological method for retting hemp (*Cannabis*). The material is introduced into masonry tanks containing water sufficient to cover it and maintained at 37°C. by means of steam pipes. Inoculation of the mass with cultures of *B. felsineus* and *Saccharomyces ellipsoideus* in relatively moderate amounts brings about retting of the fiber in 60–90 hours. The quality of the product is "perfect" in terms of commercial standards. The quantity retted varied in the experiments from 100 kgm. to 492 kgm. and this is considered by the authors as an indication that the method is applicable to larger lots on a commercial scale. Slight variations in the technic may be introduced in the procedure as a result of scientific investigations.—*A. Bonazzi.*

2419. MCATEE, W. L. **Some local names of plants, III.** Torreya 20: 17–27. 1920.—A list of 150 local names, applied to 104 species of American plants belonging to 59 families, is presented. The locality is cited wherever possible, and the source from which the name was obtained is indicted. [Previous installments appeared in: Torreya 13: 225–236. 1913. *Ibid.* 16: 235–242. 1916.]—*J. C. Nelson.*

2420. MURRILL, W. A. **Plant growths that shed light.** Sci. Amer. 122: 427, 440. 1920.—Popular description of certain luminous fungi.—*Chas. H. Otis.*

2421. MUTCH, NATHAN. **The isolation of a single bacterial cell.** Jour. Roy. Microsc. Soc. London 1919: 221–225. *1 fig.* 1919.—The organism to be studied is grown upon a solid medium for six or eight hours, and the resulting growth emulsified in sterile broth or normal saline solution. One or two narrow rings of filter paper are then placed in the hanging drop cell and moistened with saline solution. The rim of the cell is prepared with vaseline. A clean cover slip is flamed and when cooled a micro-drop of emulsion of bacterium is placed in its center by means of a very small loop of platinum wire. The slip is immediately placed in position over the moist chamber. A series of such drops can be prepared and examined rapidly and the dilution of the original emulsion adjusted until a drop containing a solitary organism is found. The cover slip is raised from the cell, a large drop of suitable medium is placed close to the micro-drop and the slip is tilted until the two coalesce. The slip is then placed on another moist cell, incubated for 24 hours, and again examined. When a solid medium is employed, if original observation was correct, one colony only will have developed. In working with delicate organisms the process must be carried out at body temperature on

a warm stage, and the filter paper ring must be replaced by a small drop of saline solution, only two or three times as large as the micro-drop. When the observation is complete, the large drop of medium is added, the slip is transferred to a moist cell containing paper ring, and the preparation is incubated as before.—The advantages of this method are that no special skill or practice is called for, no special preparation is needed, and the work can be performed with the ordinary apparatus found on a bacteriological bench; the time required is only one or two hours.—*Julia Moesel Haber.*

2422. RUDOLFS, W. **Experiments on the value of common rock salt and sulfur for killing stumps.** Soil Sci. 9: 181–189. *Pl. 1–4.* 1920.—Sulphur applied to high or low brush stimulated the growth of the live tree stumps. Rock salt up to 2.5 tons per acre did little harm while 0.5 to 1 ton per acre acted as a fertiliser. Applications of 2 to 3 tons per acre of sodium chloride to stumps cut in the winter killed or severely injured them. The salt should be applied in the spring just before the leaves appear.—*W. J. Robbins.*

2423. SAGASPE, M. J. **Sur la Digitale (Digitalis purpurea).** [A note concerning Digitalis purpurea.] Actes Soc. Linn. Bordeaux. Proces-verbaux. 68: 64–65. 1914.—Three monstrosities of *Digitalis purpurea* are briefly described.—*W. H. Emig.*

2424. TROWBRIDGE, P. F. **Report of the director, July 1, 1917, to June 30, 1919.** North Dakota Agric. Exp. Sta. Bull. 136. *83 p., 5 fig.* 1920.—This embraces the annual report of the station for two years. A brief summary is given of the experimental work including a limited amount of data.—*L. R. Waldron.*

2425. WAKSMAN, SELMAN A. **The industrial application of enzymes of Aspergillus oryzae.** [Abstract.] Absts. Bact. 4: 7. 1920.—The enzymes of *A. oryzae* hydrolyse starch completely whereas malt diastase does not; and the quantity of starch hydrolysed is 4 to 6 times greater. The enzymes are useful in the textile industry for removing "size," in clearing fruit extracts which contain some starch, and in the manufacture of various starch derivatives. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

2426. WYANT, ZAE NORTHRUP. **Experiments in silage inoculation.** [Abstract.] Absts. Bact. 4: 6. 1920.—Various strains of lactic acid producing bacteria were used to inoculate ensilage. After fermentation for 5 weeks the ensilage proved very palatable to calves.—Platings were made from the interior to determine whether the types introduced predominated or not. From the first pair of inoculations with *Bact. lactis acidi* and *Bact. bulgaricum* the first organism was recovered without difficulty, the latter not at all. The organisms which predominated in each silo were short rods in pairs which resemble *Bact. lactis acidi* in morphology, spore-forming rods, and a few yeasts. [From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

INDEX TO AUTHORS' NAMES IN VOLUME V

(References are to Entry numbers; an asterisk before a number signifies that the entry referred to is by citation alone—no abstract.)